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THE ROOT OF IPOMŒA PANDURATA.

BY CONSTANZ MANZ, PH.G.

From an Incagural Essay.

This root, commonly known as Man-root, Man-of-the-earth, Wild Jalap and Wild Potato, is elongated, cylindrical, two or three feet long, one to several inches thick and abruptly contracted above to the thickness of a finger. It appears in commerce in transverse and longitudinal slices, with the bark slightly overlapping. The longitudinal slices are from five to eight inches in length and from one to two or more inches in width.

The root is of a brownish-gray color externally and grayish-white internally and presents protrusions of resinous matter due to a resinous milk-juice, which exudes when the root is cut while fresh. A transverse section of the root shows a cortical portion of about one-eighth of an inch in thickness, with resin cells forming a dense zone near the cambium line; internally it consists of a parenchymatous portion which is somewhat depressed, and contains numerous wood bundles radiating from the centre and numerous resin cells. The root has a short and rather mealy fracture, a sweetish odor and a sweetish, afterwards bitter and slightly acrid, taste.

ANALYSIS.

Thirty-two troy ounces of the root were reduced to a coarse powder and treated with alcohol, sp. gr. .835, until the percolate ceased to produce cloudiness on being dropped into water. The tincture was evaporated to a syrupy consistence and precipitated with water, the precipitate collected, dissolved in alcohol, again precipitated and the same manipulation repeated until the water ceased to acquire color. The resin was further purified by filtering its alcoholic solution through animal charcoal and evaporating. The root yields about 1.5 per cent. of this resin.

The aqueous solutions were poured together and evaporated, leav-

ing a reddish-brown mass having the taste of burnt sugar. A portion of it was dissolved in water and solution of subacetate of lead added, which produced a yellowish precipitate. This was collected on a filter, washed, suspended in water and treated with sulphuretted hydrogen, by which the lead was eliminated. The liquid was boiled to free it from sulphuretted hydrogen. Upon adding ferric chloride to this solution, it gave a greenish-blue coloration which did not disappear on boiling; solution of gelatin added to another portion produced no precipitate. The coloration produced with iron is probably due to some coloring matter acting similar to tannin. The filtrate was freed from lead and, with Trommer's test, deposited red cuprous oxide, indicating the presence of sugar.

The resin is of a yellowish-brown color, fusible, breaking with a glossy, resinous fracture and translucent on the edges. It becomes much lighter in color on repeated solution in alcohol and precipitation with water. The powder is yellowish-gray to yellowish-white in color, has a slight odor at ordinary temperature, which becomes more perceptible on heating. It is soluble in chloroform and in ether. Its solution in alcohol has an acid reaction to litmus paper. It dissolves in aqueous alkalies, from which solution it is precipitated by hydrochloric acid. Methylic alcohol dissolves it to some extent. It is insoluble in benzol, benzin and acetic acid. Its cathartic properties were shown by experiments; given to adults in three-grain doses, it operated within two hours of the time it was taken, causing considerable griping and producing watery stools. The resin was boiled with successive portions of water until the last gave no reaction for sugar. It was then boiled with very dilute sulphuric acid, filtered, and the filtrate freed from sulphuric acid by adding carbonate of barium. This filtrate, when treated with Trommer's test, caused a precipitate of red cuprous oxide, showing the resin to be a glucoside.

To an alcoholic solution of the resin, acetate of lead was added, which produced a precipitate. The filtrate was treated with an alcoholic solution of ammonia until completely precipitated. This precipitate was collected, mixed with the first precipitate, washed with alcohol, then suspended in alcohol, freed from lead, filtered and evaporated to dryness. This resin is of a light-brown color, transparent in thin layers, has the odor and taste of pop-corn and is soluble in alcohol, ether, chloroform, methylic alcohol and in hydrate of potassium, from which it is precipitated by hydrochloric acid. It is insoluble in

benzol, benzin, acetic acid and turpentine. It gives an acid reaction with blue litmus. Dissolved in hydrate of potassium, it produces a golden-yellow solution. The filtrate from this resin was freed from lead, filtered and evaporated to dryness, leaving a light-brown soft resin, having an odor similar to that precipitated by alcoholic solution of acetate of lead and solution of ammonia. It gives no reaction with litmus paper. It is soluble in ether, alcohol, chloroform and in hydrate of potassium, from which solution it is precipitated by hydrochloric acid. It is insoluble in benzol, benzin, acetic acid and methylic alcohol. Both resins were found to be glucosides by applying the same test as with the first. Sulphuric acid added to any of the three resins produces a carmine color which changes to brown and afterwards black.

Finely powdered root was triturated in a mortar with water, thrown on a strainer, washed repeatedly with water to extract starch granules. These were repeatedly washed with water by decantation, collected on a filter and dried. The granules are of a grayish color and when viewed under the microscope somewhat resemble wheat starch. A decoction of the root, when tested with a solution of iodine, gave a blue coloration.

FALSE SENEGA.

BY JOHN M. MAISCH.

In 1876 ("Proceedings Amer. Phar. Assoc.," 1876, p. 661) Mr. Wm. Saunders directed attention to a root of which large quantities were then in the market, and which was sold as senega, but was deficient in acidity. In endeavoring to ascertain its origin, I was able to trace one lot of it to Greene county, Mo., where it was said to have been collected ("Amer. Jour. Phar.," 1877, p. 517), but did not succeed in obtaining either specimens of the root collected in that locality or of the plant. My attempts to solve the question, with the aid of several pharmacists near the locality named, were likewise unsuccessful. In the meantime the drug continued to appear in the market, and on inquiry it was usually said to have come from Texas, or another of our Southern States.

The same root has likewise been noticed in Europe; among others, it was described by Mr. Thos. Greenish ("Amer. Jour. Phar.," 1878, p. 522), who regarded it as young and immature senega, a conclusion

which did not agree with my observation (Nat. Dispensatory, 1st edit., p. 1251; 2d edit., 1286). E. Siebert ("Amer. Jour. Phar.," 1880, p. 469) suggested that this false senega might be derived from one of the numerous Central American species of *Polygala*.

Recently Dr. J. H. Gunn, of Calera, Ala., sent to the editor of "New Remedies" a plant which had been successfully used in place of senega, and this plant was recognized as *Polygala Boykinii*, Nuttall ("New Remedies," July, 1881, p. 208). No allusion having been made to the character of its root, I applied to Dr. Gunn for a specimen of the plant, with root, and was kindly supplied by him. The root closely resembles senega root, but is entirely destitute of the keel-like line of the latter, and in all its parts has a woody column circular upon transverse section. On comparing the root with the specimens of false senega in my collection they proved to be identical, and the microscopic structure agrees with that previously described by Thos. Greenish, and more recently by Geo. Goebel, Jr. (see last number, p. 321).

Dr. Gunn writes that the plant was brought to his attention a few years ago by an irregular practitioner, who thought it was *Polygala senega*, and who has been quite successful in treating chronic bronchitis with it in compound infusion.

The plant is one of the herbaceous perennial species of *Polygala*. Several slender stems are produced from the same root, and rise to the height of 12 or 18 inches without branching. The leaves are in whorls of about five, attain a length of about an inch, and vary between lanceolate and obovate in shape, the upper ones being even linear and sometimes alternate. The flowers are in terminal, slender, rather dense spikes, and are of a whitish color, with roundish, partly green wings. The seeds are hairy and have a caruncle of about two-thirds the length of the seed. The plant flowers from May or June to July or August, and grows in rich calcareous soil in Georgia and Florida and westward.

It would be of interest to examine the roots of the other perennial species of *Polygala* of our Southern and Southwestern States, to ascertain whether, in appearance and properties, they likewise resemble senega. Although the root of *Pol. Boykinii* undoubtedly possesses remedial properties, it is milder than true senega, and cannot be regarded as an equally efficient substitute for it.

ASPIDIUM RIGIDUM.

BY WILLIAM J. BOWMAN, PH.G.

From an Inaugural Essay.

This fern is indigenous to the Pacific coast, where it is found in rocky cañons and on hill-sides. It is confined principally to the eastern slope of the coast range, extending northward to Oregon and southward to Mexico. The following description of the plant is given by Professor Eaton: Root-stock short, stout, ascending or erect; fronds in a crown, on chaffy stalks, half evergreen, firm-membranaceous, smooth and green above, paler and more or less glandular beneath, 1 to 3 feet high, ovate-lanceolate or triangular-lanceolate, usually fully bipinnate; pinnae broadly oblong-lanceolate, the lowest ones broadest and scarcely shorter than the middle ones; pinnules oblong, incised or doubly serrate, with spinulose teeth, conspicuously veiny; sori large, nearer the mid-rib than the margin; indusia firm, convex, orbicular, with a very narrow sinus, the edge bearing short-stalked glands."

The rhizomes which I have seen are from 4 to 10 inches in length, closely covered with the remnants of stipes, and with these from an inch to an inch and a half thick. They are covered with a brown chaff, and densely beset with wiry rootlets. The rhizomes deprived of the stipes are from one-half to nearly an inch in diameter, and show, upon the transverse section, an arrangement very similar to that of *Filix mas*, the main difference being that the vascular bundles, found in a circle, are about six in number. It has a peculiar aromatic odor and a sweetish taste, which becomes acrid, bitter and astringent.

This California fern has as yet established only a local reputation as a medicinal agent, but, judging from the verdict of several physicians who have employed the drug, it deserves a more extended use. Prof. H. Behr, of San Francisco, has long used the *Aspidium rigidum* in his practice in the treatment of *tænia*, and with better results than he has been able to obtain from any other vermifuge. In 1863 he called the attention of the late Dr. J. B. Trask to its medicinal value, and for many years the doctor used it in his practice, and with such good results that he considered it a specific in the treatment for tape-worm. Prof. Behr employed the fresh rhizome, which he found more effectual than the dried. The fact of its having been used in the fresh state may, in some degree, account for the superior effects obtained from it.

Believing an analysis of the rhizome of this fern desirable, in order to establish the relation of its medicinal constituents to those existing in *Filix mas*, I have made some investigations, of which the following is an account: From a quantity of the rhizome, carefully dried, the stipes and all the outer brownish portions were removed, and the powdered rhizome exhausted with ether, sp. gr. .750. The ethereal solution was of a reddish-brown color with a greenish tinge. The greater part of the ether having been distilled off, and the residue exposed in a capsule until the remainder of the ether had evaporated, an oleoresin of thick oily consistence was obtained, having a greenish-brown color, an aromatic odor and the bitter, nauseous and somewhat acrid taste of the drug. On standing, it soon deposited a resin, which was separated and treated with alcohol. After evaporation of the alcohol the resin was of a reddish-brown color, but darkened on long exposure to air, and became hard and brittle; it possessed an aromatic odor and disagreeable bitter taste, was readily soluble in ether, alcohol, turpentine, ammonia, potassa and carbonate of potassium, and was heavier than water. The alcoholic solution gave an acid reaction, and the resin was evidently similar to that obtained by Luck from *Aspidium filix mas*.

The ethereal extract of the rhizome, after standing a few days, deposited yellow crystals on the sides of the containing vessel. A portion of the extract with the contained yellow crusts was diluted with ether-alcohol, then with two measures of water at about 40°C., and ammonia water added until the liquid smelled of ammonia; the whole was then shaken. After allowing it to stand, the lower brown layer was separated from the supernatant oil, filtered and precipitated with hydrochloric acid, the precipitate quickly balling together to a soft, plaster-like mass. This was kneaded with warm water, and crystallized from boiling stronger alcohol, the crystals washed with alcohol of 80 per cent., and purified by dissolving them in ammonia water, precipitating with hydrochloric acid, washing with alcohol of 80 per cent., and finally recrystallizing from boiling stronger alcohol. The result was a light bright yellow crystalline powder, having a slight nauseous taste and in ethereal solution an acid reaction. When heated it yielded an oily distillate, smelling of butyric acid. It burned with a luminous flame when heated on platinum foil, and left a shining charcoal. Heated with ammonia water it quickly assumed a dark

brown-yellow color. It was insoluble in water, sparingly soluble in aqueous alcohol, soluble in boiling absolute alcohol, in fixed oils, and very soluble in sulphide of carbon and volatile oils. It is probably identical with Luck's filicic acid.

Treatment with Alcohol.—The drug, exhausted with ether and dried, was next macerated and percolated with alcohol. The alcoholic percolate was of a reddish-brown color, and had an acid reaction. The greater portion of the alcohol was distilled off, and the residue evaporated over a water bath to the consistence of honey. The liquid obtained was transparent, of a reddish color, and had a sweet and strongly astringent taste. An endeavor was made to crystallize cane-sugar from the solution, but was unsuccessful. The syrupy liquid was dissolved in water, filtered, and a portion of the filtrate treated with a dilute solution of gelatin, which gave a milky precipitate; another portion gave a greenish-black precipitate with ferric chloride. The remainder of the solution was precipitated by acetate of lead, and filtered, the excess of lead removed by H_2S , and the filtrate tested for glucose by Fehling's solution, a brick-red precipitate of cuprous oxide indicating its presence. The precipitates by ferric chloride and by gelatin denote the presence of tannin.

Treatment with Cold Water.—The drug, after having been treated with ether and alcohol, was dried and macerated with water for several days, and strained. A turbid liquid, having a slight acid reaction, was obtained. On boiling, filtering, concentrating and adding alcohol, a flocculent precipitate of gum separated, which was soluble in water, and was precipitated from the aqueous solution by acetate and subacetate of lead.

Treatment with Boiling Water.—The drug, after having been exhausted with cold water, was next treated with boiling water. The liquid, strained and evaporated to a low bulk, deposited on cooling a brown jelly-like substance, which was insoluble in cold water, and is probably pectin. A portion treated with iodine gave a distinct blue color, showing the presence of starch.

The constituents, the presence of which was ascertained, are resin, filicic acid, fat, tannin, glucose, gum, pectin and starch.

THE BARK OF SAMBUCUS CANADENSIS.

BY CHARLES G. TRAUB, PH.G.

From an Inaugural Essay.

The bark of the European elder has been analyzed, and that of the American species having been stated to probably contain the same constituents, I examined it with a view of ascertaining that fact.

The air-dry drug was found to contain 13 per cent. of water and $8\frac{1}{2}$ per cent. of ash. A portion of the ground bark was exhausted with hot water, the decoction acidulated with sulphuric acid and distilled; the distillate had an acid reaction, was neutralized with caustic soda and evaporated cautiously over a water-bath to dryness. The presence of valerianic acid in the residue was proven by dissolving a portion in water, acidulating with sulphuric acid, adding alcohol and heating, when the odor of oil of apples (amyl valerianate) was evolved; also by treating the solution of another portion with sulphate of zinc, when small crystals of valerianate of zinc were obtained.

Another portion of the bark was exhausted with benzin and the percolate evaporated spontaneously. From the residue, which contained fat, the bitter principle could not be obtained pure by solvents such as stronger ether, benzin, chloroform and a mixture of ether and chloroform. The distillate from this extract with water contained an oily substance which had a strong odor resembling that of turpentine. The fat was soluble in ether and chloroform and saponifiable with caustic potash.

The bark, previously treated with benzin, was percolated with alcohol and the alcohol recovered by distillation. The extract obtained

- was poured into water and filtered (precipitate A), sugar was detected in this filtrate by Fehling's solution. The filtrate was evaporated to dryness, treated with alcohol, which only took up a part (residue B), and ether was added to precipitate the sugar. The filtrate was evaporated to dryness and the residue treated with water and filtered; this filtrate gave a pea-green color with sulphate of copper, an amber color with caustic potash and a precipitate with neutral acetate of lead. The filtrate from the latter gave a precipitate with basic acetate of lead.

The residue from the mixture of alcohol and ether, not soluble in water, was dissolved in alcohol; to this water was added, the alco-

hol evaporated spontaneously and the presence of tannin determined by means of ferric chloride, gelatin and quinia salt.

The residue B, insoluble in alcohol (of the evaporated filtrate from the mixture of the alcoholic extract and water), was dissolved in boiling water; on cooling, a portion (which was tasteless and of a reddish-brown color) separated, but was wholly soluble on the addition of caustic soda. The precipitate A, caused by adding the alcoholic extract to water, was dissolved in alcohol and precipitated (precipitate C) with alcoholic acetate of lead, filtered and precipitated (precipitate D) with ammonia alcohol (filtrate E).

Precipitate C was suspended in alcohol and decomposed with sulphuretted hydrogen, filtered from the sulphide of lead and, on the evaporation of the filtrate to dryness, a light yellowish-brown colored residue remained, which had no taste and gave with nitric acid a dark brown color.

The precipitate D was dissolved in alcohol, decomposed with sulphuretted hydrogen and filtered, and, after the evaporation of the alcohol, there was left a blackish-brown colored residue which was tasteless and with nitric acid gave a light yellow color.

The filtrate E, on standing, deposited small needle-shaped crystals of a lemon-yellow color, insoluble in water and alcohol, slightly soluble in ether and cold chloroform, and wholly soluble in boiling chloroform, but on cooling deposit again. On being heated on platinum foil, it first blackened then burnt up without leaving any residue. The quantity being so small, no further tests could be applied.

The constituents determined are valerianic acid, volatile oil, fat, resin, tannin, sugar and coloring matter, besides several compounds the nature of which was not ascertained.

Crystalline Albuminoids.—Recently Gruebler described crystalline albumen from pumpkin seeds. H. Ritthausen has made a similar observation with the press-cake of hemp seed; by exhausting it with a warm 5 per cent. solution of sodium chloride handsome octohedral and rhombic dodecahedral crystals were obtained, the substance being probably identical with that from pumpkin seeds. A similar result was obtained from the press-cake of castor-oil seeds; but neither the seeds nor the press-cakes of groundnuts, sunflower seeds, hazel nuts or Brazil nuts yielded albumen in a crystalline form. —*Chem. Ztg.*, No. 21; *Jour. prakt. Chem.*, xxiii, 481.

ODD DIRECTIONS FOR COMPOUNDING PRESCRIPTIONS.

Editor of the American Journal of Pharmacy:

By reference to almost any of the daily papers, advertisements like the following may be met with: "Prescription free. For the speedy cure of nervous weakness, lost vitality, premature debility, etc., brought on by indiscretion and excesses. Any druggist has the ingredients," etc. Or: "A philanthropist, sympathizer with suffering humanity, during his ten years' residence in the South Sea Islands, discovered a potent remedy for the cure of nervous exhaustion caused by indiscretion, etc. Prescription sent free on application to," etc. These prescriptions most always either call for drugs which do not exist, or they are accompanied with absurd directions for compounding, or with reflections on the apothecary, which let him—whose main calling is the compounding of prescriptions—appear as ignorant and incompetent and in general not qualified to put up these precious mixtures; or, in such cases where qualification is conceded, his cupid-ity in the matter of charging is adverted to.

Some little time ago I had occasion to prepare three prescriptions of this class for a customer. The funny directions, mainly, induced me to copy them. Without further comment, they will doubtless afford much amusement to the readers of the JOURNAL. Here they are, *verbatim*:

Pariera brava,	. . . . .	1/4 ounce
Hydrastis,	. . . . .	1 "
Peruvian bark calisaya,	. . . . .	1 "
Carbonate lythia,	. . . . .	2 drachms

Mode of Preparing.—Put one quarter ounce pariera brava to one ounce of boiling water; let it stand for two hours; then add of finely powdered hydrastis one ounce; mix well and reduce to the consistency of syrup by evaporation. Put one ounce Peruvian bark calisaya to two ounces of boiling water; let it boil five minutes, and filter by the usual process. Then wash two drachms carbonate of lythia in proper vessels, and add all the ingredients together, and heat on a slow fire, in a close covered vessel, to 100 degrees specific gravity; remove it to a mortar, pulverize well and triturate; to be divided into 180 powders.

PILL No. 1.

Concentrated extract of coca,	. . . . .	10 grains
Phosphorus,	. . . . .	2 "
Syrup iodide iron,	. . . . .	40 drops
Pepsin,	. . . . .	2 drachms

Prepare ten grains of concentrated extract of coca by the vacuo process; then thoroughly incorporate two grains of crude phosphorus with glycerin or mutton suet, to insure a fine subdivision of particles; add the prepared coca, and the remaining ingredients after reducing them to fine powders. Triturate well and form a pill mass with the usual incipients. Make into 60 pills and sugar coat them.

PILL No. 2.

Monobromide of camphoræ,	8 grains
Extract nux vomica,	1 drachm
Blood root,	1 "
Extract buchu,	2 "

Macerate eight grains monobromide of camphoræ in two drachms of warm water; let it stand for 12 hours, then percolate by displacement with the customary apparatus, and add one drachm of extract of nux vomica. Then macerate two drachms of extract buchu in one-half ounce of warm water. Let it stand six hours, and percolate the same as for monobromide of camphoræ; mix all the ingredients in a porcelain mortar. Triturate and apply the usual heat for pharmaceutical purposes until the substance is reduced to a pill mass, to which add the usual incipients; make into 60 pills and sugar coat.

G. H. CHAS. KLIE.

Lowell, N. St. Louis, Mo., July, 1881.

PHARMACEUTICAL NOTES.

BY ROBT. F. FAIRTHORNE, PH.G.

Cheap and convenient moulds for camphor-ice, cosmetic etc., can be made in the following manner: Cut off two or three pieces of glass tubing, each 12 inches long and $\frac{3}{4}$ of an inch in diameter, and, having closed one end of each piece with a cork, you have moulds that are everything that can be desired. When used they are placed in ice water, and the melted camphor-ice or butter of cacao is poured into them and allowed to become solid, when, with slight pressure, they can be pushed out of the tubes and cut up into suitable sized pieces, which should be wrapped up in waxed paper or tin foil and covered with colored paper. The sticks of camphor-ice, etc., are quite ornamental, especially when various colored wrappers are used. Each piece of tube of the length named will be long enough to make four sticks of the ordinary size.

A Device for Marking Poisons.—H. C. Blair's Sons, of this city, have constructed a novel contrivance to guard against poisonous substances being used by mistake for innocent ones. It consists of a small wooden ball about $\frac{5}{8}$ of an inch in diameter attached to the bottle or

box by means of a chain fastened to an India rubber ring around the neck of the vial or to a tag pasted on the bottom of the box. It certainly forms a very distinctive feature in designating articles of a dangerous character, as the packages containing such could scarcely be handled without warning being given by the "Acme Poison Guard," as they term it.

Cement for Mending Pestles, etc.—One of the strongest cements that I have ever used, and one that can be very readily made, is obtained when equal quantities of gutta percha and shellac are melted together and well stirred. This is best done in an iron capsule placed on a sand-bath, and heated either over a gas furnace or on the top of a stove. It is a combination possessing both hardness and toughness, qualities that make it particularly desirable in mending pestles and mortars. I found it very useful for securing the handles to the wedgwood ware, and some old ones that were much chipped and split, when thus mended, have been quite as useful as new ones, and have stood several months' wear without any apparent change. Of course, when this cement is used the articles to be mended should be warmed to about the melting point of the mixture, and then retained in proper position until cool, when they are ready for use.

Compressed Granules for Hypodermic Use.—Of the various forms in which powerful medicines are dispensed for hypodermic use perhaps none are so convenient as the small compressed granules or tablets that are now being introduced to the notice of physicians (see a recent article on this subject in the last December number of the "Amer. Jour. Pharm.," page 593). As the uses for which these are intended have of late increased, and as this method of administering medicine has grown in favor both with the physician and patient, a mention of the care that ought to be taken in their preparation may not be out of place. The advantages of convenience, accuracy and of being presented in a form not liable to undergo change, will doubtless bring them into general use.

These pellets are small disks, weighing from $\frac{1}{2}$ grain to a grain, and are of the same shape as compressed pills, and made in the same manner. In making them great caution and precision are necessary, not only in thoroughly mixing the ingredients, but in using such as are prepared especially for the purpose, the reasons for which will be presently explained. The medicinal ingredients they contain, such as morphia hydrochlorate or sulphate or the atropia salts, etc., are mixed

carefully with sodium chloride or sulphate, in order to render the alkaloids more readily soluble by separation of their particles, which, by the compression necessary, would otherwise be in a condition that would require more time to effect solution than would be convenient. The sodium sulphate has been adopted as a diluent or disintegrator by Messrs. Wyeth & Brother, of this city, at the suggestion of Professor Roberts Bartholow. It has the advantage of being an efflorescent salt, so that however long kept the granules will not absorb moisture, and the medicinal ingredients, therefore, will remain unchanged.

Both the sulphates of sodium and of morphia, as found in the market, contain mechanical impurities that should be carefully removed before using, as particles of dust, fibre, etc., if injected might give rise to much inconvenience, and, in some cases, produce abscess. The salts are dissolved in distilled water, the solutions filtered and the filtrate evaporated until crystallization begins, and afterwards in a warm place occasionally stirred and evaporated to dryness. During this operation all dust should be carefully excluded. Working on a large scale the evaporation may be conducted in a hot-air chamber, to which air is admitted by passing it through cotton felt.

The employment of crystallizable substances, such as sulphate or chloride of sodium, as a diffusing agent is certainly preferable to gelatin, which has also been employed, the objection to which is that being a nitrogenized body it is prone to undergo decomposition when exposed to heat and moisture.

I am indebted to Messrs. Wyeth & Brother for some of the foregoing suggestions.

"*Musk Rat Musk.*"—The difficulty of obtaining pure musk, and the high price of the same, makes it a desideratum to find a substitute for it for use in perfumery that possesses the advantages of strength and cheapness. We find these in an article called by the above title, and offered for sale by numerous itinerant colored merchants, who come chiefly from New Jersey, where they obtain their supplies, and offer the musk pods generally at the moderate price of 10 or 15 cents a pair. If 10 or 12 pairs are cut up with scissors into small pieces, and, with the addition of 2 drachms of slaked lime, allowed to macerate for a week or two in a pint of alcohol, a very fragrant tincture will be obtained, which will be found at least three times as strong as the tincture or extract of musk generally employed. I have

used it for several years in making the most delicate-flavored colognes, and found it to answer equally well as the musk generally employed.

I do not know whether the musk from musk rats has ever been used as an internal remedy. If any of the readers of this journal have known of its being so employed I hope that they will communicate their experience.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

INORGANIC CHEMISTRY.—*On the Existence of Free Fluorine in Certain Fluorspars.*—Oscar Löw has examined the strong smelling substance which is liberated when the violet-black fluorspar of Wölsendorf is decomposed. Schafhäütl had explained this previously, by assuming the presence of calcium hypochlorite, Schrötter had assumed ozone, and Schönbein antozone to be present. Löw became convinced that the odor was owing to free fluorine, and at once called to mind observations of Schrötter's that, while showing the impossibility of ozone being present, made it likely that free fluorine might be. Thus a temperature of 310°C. did not destroy the odor, while rubbing up the mineral with caustic potash solution changed it considerably; when rubbed up with sulphur, an odor like chloride of sulphur was developed; and lastly, that the odoriferous substance liberated chlorine from sodium chloride and iodine from potassium iodide. Löw also observed that when the mineral was rubbed up with dilute caustic potash a solution was obtained that decolorized indigo almost instantly like hypochlorite solution.

In order to test the question more thoroughly, Löw rubbed up 1 kilo of the mineral, in small portions at a time, with weak ammonia water, using filtrate and wash-water for the successive treatments. The last filtrate was treated with sodium carbonate, evaporated, and to the residue, placed in a platinum dish, sulphuric acid was added. This was covered with a glass plate, and kept for some time at a temperature of 40° to 50°C. The result was a very decided corrosion of the glass.

As to the question as to the nature of the fluoride which yields the free fluorine, Löw thinks the presence of cerium in this fluorspar from Wölsendorff shows it to be cerium fluoride, which, separated originally along with the calcium fluoride at low temperatures, when the tempe-

perature rises decomposes into cerous fluoride and free fluorine, just as manganese tetrachloride at ordinary temperatures separates into manganese chloride and free chlorine.—*Ber. der Chem. Ges.*, xiv, p. 1144.

On Boron Hydride.—While the existence of a hydride of boron seemed possible because of the relations of the element to the nitrogen group, on the one hand, and to silica on the other, in both of which cases hydrides were known, the compound had not been prepared. Jones and Taylor already in 1879 indicated the existence of such a compound, and they now describe it more in detail. They found that it could not be prepared by a method analogous to that used in the preparation of silicon hydride, viz., the formation of magnesium silicide by the action of magnesium upon potassium silicofluoride. The methods which allow of its production are the preparation of magnesium boride by (1) heating magnesium with boric anhydride, (2) by direct union of boron and magnesium, (3) by the action of magnesium upon boron trichloride. Magnesium boride, obtained in any of these ways yields, on addition of an acid, boron hydride mixed with a large excess of hydrogen. The gas burns with a green flame, is decomposed by heat, with separation of boron, dissolves slightly in water, and gives a black precipitate with silver nitrate, containing silver and boron; it combines with ammonia, yielding a compound which is decomposed by acids. The composition of the hydride, so far as could be ascertained by combustion of the gas with copper oxide, is represented by the formula H_3B .—*Jour. Chem. Soc.*, May, 1881, p. 213.

On the Artificial Production of Nitric Acid.—The well-known fact that nitrogen and oxygen in the presence of watery vapor are converted by the passage of the electric spark into nitric acid was established by Frémy and Becquerel with the aid of a Ruhmkorf coil. Since that time, electro-magnetic machines have been so greatly improved that the problem of manufacturing nitric acid artificially can be now taken up seriously and with promise of commercial success. According to a Belgian journal, this has been accomplished as follows: The electric spark is made to discharge through a series of closed vessels through which a current of air is passing, whereby red nitrous fumes are produced, which, carried by the current of air, pass up an absorption-tower in which caustic potash solution is descending. Absorption takes place at once, and a tolerably strong solution of potassium nitrate results.—*Moniteur Ind.*, vol. 7, p. 526.

On the Action of Potassium Nitrite upon Ammonium Chloride.—It has long been known that when a solution of potassium nitrite and ammonium chloride is heated water and nitrogen are formed. But if a mixture of dry potassium nitrite and dry ammonium chloride is heated such is not the case. Dr. D. Tommasi finds that the products of this reaction are very complex, and their nature depends on the quantity of the salt used, and particularly on the temperature to which the mixture is heated. If 10 grams of potassium nitrite are melted in a porcelain crucible, and then a small quantity of ammonium chloride be added, we notice that this salt commences to rotate with a variable velocity, and then takes fire and burns with a violet-purple flame, accompanied by a feeble detonation; in fact it behaves exactly like a globule of potassium burning upon water. With ammonium sulphate the phenomenon is more striking, but only very small quantities should be used, or the experiment will become dangerous on account of the projections. The products of the reaction between potassium nitrite and ammonium chloride are: potassium chloride, ammonia, nitrous fumes, and probably nitrogen as well. Ammonium nitrate, when in contact with melted potassium nitrite, produces a remarkable luminous phenomenon. If the ammonium nitrate is in small crystals, a series of phosphorescent points are formed; but if, on the contrary, one crystal, however small, be introduced, it forms a globule surrounded by a phosphorescent ring, and it rotates with great rapidity, and then suddenly explodes, producing a beautiful flame.—*Chem. News*, May 27, 1881, p. 241.

ORGANIC CHEMISTRY.—*Essential Oil from Hemp.*—The essential oil from *cannabis indica* has already been examined by Bohlig and by Personne, the latter of whom obtained from it a liquid and a solid hydrocarbon. L. Valente has prepared the essential oil from ordinary hemp (*cannabis sativa*), by distilling the fresh leaves with water and agitating the milky distillate with ether. The oil dried over calcium chloride and distilled repeatedly from sodium is colorless and mobile (boiling-point 256° to 258°C.) Its specific gravity at 0° referred to water is 0.9292. The analyses agreed with the formula $\text{C}_{15}\text{H}_{24}$; the vapor density, however, could not be determined by the ordinary methods, as it decomposes at 300°C. The oil mixes, in all proportions, with alcohol, ether and chloroform. Bromine acts energetically on it, forming a crystalline compound which has not yet been investigated.

Nothing at all resembling the solid hydrocarbon mentioned by Personne could be observed.—*Jour. Chem. Soc.*, May, 1881, p. 284.

On Quercotannic Acid, the Principle of Oak-bark.—J. Loewe has investigated the quercotannic acid of oak-bark and has found that it is not a glucoside. It occurs in the oak-bark in two forms, one easily soluble in water and one difficultly soluble. To the first he gives the formula $C_{28}H_{28}O_{14} \cdot H_2O$ and to the second $C_{28}H_{24}O_{12}$. Both are changed by the action of dilute acids into the red derivative called oak-red, $C_{28}H_{22}O_{11}$, while water is eliminated.—*Zeit. Anal. Chem.*, 20, p. 208.

Preliminary Notice on the Synthesis of Methylconine and on the Constitution of Conine.—Michael and Gundelach have studied the reactions of paraconine, which Schiff first prepared synthetically from butyl aldehyd and alcoholic ammonia. They prepare it more advantageously from butylidene chloride. The base which they obtain by the treatment of this chloride with methylamine they consider to be identical with the methylconine which Von Planta and Kekulé found occurring in the hemlock along with conine. They hope, by the distillation of the hydrochlorate of this base in a stream of hydrochloric acid gas, to obtain conine.—*Ber. Chem. Ges.*, xiv, p. 1110.

A. W. Hofmann, in studying the action of heat upon ammonium bases, has also thrown some light upon the constitution of conine. He considers that it has two hydrogen atoms more than the formula of Von Planta and Kekulé demands. Hofmann gives it the formula $C_8H_{17}N$ or $(C_8H_{16})^{II}.HN$.—*Ibid.*, xiv, pp. 659 and 705.

STRANGE RESTORATION OF COLOR IN SYRUP OF IODIDE OF IRON.

BY GEORGE W. HAYES.

About March 1st, 1881, the writer commenced a series of experiments to determine a good method of preserving from change Syr. Ferri Iodidi. In order to accomplish this purpose, the various preservatives that have been from time to time recommended, such as sol. of hypophosphorous acid, hyposulphite of sodium, reduced iron, tartaric acid, glycerin, glucose, etc., were used. Sixteen different experiments were made, the same quantity of syrup of iodide of iron being made in each case. The bottles, which were full, were well corked, and all placed exactly under the same external conditions, this

being accomplished by placing them in a line on the top of a very high shelf, in a well-lighted room, *out of the reach of direct sunlight* as well as of investigating juveniles. When the last experiment had been finished, all the corks were removed from the bottles, and they were allowed to stand for several weeks. By the end of this time, a great change of color had taken place in some of the syrup, a portion of it being decidedly of a dark brown color throughout its depth; another portion had not apparently changed in the slightest degree from its normal color (very light green), while the remainder of the syrup was of various shades, between a dark brown and a very light green. The bottles were then re-arranged in the order of the amount of decomposition that had taken place, the bottle that contained the darkest (dark brown) syrup being placed at one end (the left) of the line, then following it the next darkest, and so on, until the other end (the right) of the line was reached, which contained the syrup that had not been changed at all. (This was done for the purpose of ascertaining the comparative rapidity of the decomposition among the specimens.) In this order they have remained. I have been in the habit of looking at them occasionally ever since. But now comes the strangest part of all.

About two weeks ago my attention was again called to them, and, strange to relate, *they had all, with the exception of two, resumed their original normal color (very light green).*

The two *unrestored* specimens occupied relatively the fifth and eleventh positions from the *previously* most changed end (the left) of the series.

The fifth was made by adding 5 grs. of reduced iron to one pound of the syrup (containing somewhat more sugar than the official). This specimen is now of a light brownish-yellow color, whereas all the four experiments to its left, *previously* darker, are *now* of their original color (very light green).

The eleventh was made by adding 5 grs. of hyposulphite of sodium to one pound of syrup as before. This is now of a light yellowish-green color, and contains a precipitate of sulphur. All the experiments to its left, with the exception of one (the fifth, previously noticed) are *now* lighter, not having any yellowish tint at all.

On Aug. 10th, 1880, I made Syr. Ferri Iodidi strictly according to the Pharmacopœia, and as I had twenty fluidounces, I filled a pint bottle, and put the residue of four fluidounces in another pint bottle,

corked it well and put it away. This residue changed rapidly, and became very dark. Wondering whether it had been changed any for the better, I went to the bottle a few days ago and found that it had been *completely restored*. So you see the change affected corked and uncorked bottles alike.

The only reason that I can now assign for this peculiar restoration of color is the presence of electricity from our recent storms; for this is apparently the only *new* factor that has entered to change the external conditions since the experiments were arranged in the order of their preservation. In supposing the restoration of color to be owing to electrical influence, I am well aware that it is opposing an opinion advanced by Mr. Hancock (see Proceed. American Pharmaceut. Asso., 1876, p. 665) that the *decomposition* of Syr. Ferri Iodidi is somewhat *accelerated* by the ozone from "a good deal of electricity in the atmosphere"; yet I am forced to the above conclusion by the facts furnished by my entirely unlooked-for experiment. Perhaps, when summer days are past, and the "Storm King" has retired with his lightning-flash and thunder-clap to other climes than ours, I may again be permitted to resume experiments, which he so unexpectedly and unceremoniously brought to naught.

Philadelphia, July 18, 1881.

PRACTICAL NOTES FROM FOREIGN SOURCES.

BY THE EDITOR.

Dry Narcotic Extracts, rendered pulverizable by dextrin, have frequently been found to attract moisture. A correspondent in "Phar. Zeitung," May 7, p. 276, states that this difficulty arises in consequence of insufficient exsiccation. The extract is mixed with dextrin sufficient to form a firm pill-mass which is rolled out into thin cylinders, and these, protected against dust, are kept in tin vessels upon the stove, in a place where the heat never rises above 60°C. In a few weeks the cylinders are powdered and the powder placed in a porcelain dish, kept again for several weeks in the warm place, when the weight is augmented to twice the weight of the extract used by the addition of well-dried dextrin. Thus prepared, the extracts will keep perfectly dry in the ordinary shop bottles. H. Schweikert agrees with the above, but objects to the long exposure of the extracts; by the aid of a steam-bath the extracts are thoroughly dried in a few hours.

Tartarus Boraxatus, borotartrate of potassium and sodium, dried in a similar manner, will keep equally well.

Elatina is a preparation largely used in Italy in place of tar-water. Ciutlini gives the following formula: Green pine cones, 6 kilos; olibanum, 80 gm.; tolu balsam, 50 gm.; Burgundy pitch, 40 gm.; juniper berries, 600 gm. The mixture is macerated over night in sufficient water. Afterwards 12 kilos of distillate are obtained by the aid of a slow fire. The liquid is filtered, bottled and used in doses of half a tumblerful two or three times a day.—*Phar. Ztg.*, May 11, p. 285.

Steatina are preparations of about the consistence of wax and intended for external use in the place of ointments and plasters which are, the one too soft and the other too hard, for obtaining the full effects of the medicinal ingredients. The old name *cerata* has been discarded, since many of the compounds do not contain wax.

Steatinum Belladonnæ.

R Sebi ovilli, p. 5
Adipis suilli,
Emplastri plumbi solidi,¹ aa p. 2
Extracti belladonnæ, . . . p. 1
Melt the first three articles together, and when congealing add the extract, previously triturated with a mixture of equal parts of water, alcohol and glycerin, until of a syrupy consistence. Mix thoroughly.

In the same manner prepare *Steatinum conii*, *Steat. digitalis* and *Steat. hyoseyami*.

Steatinum Chlorali Camphoratum.

R Chlorali hydratis,
Camphoræ, aa p. 2
Mix in a vial at a moderate heat until liquefied, then add
Cere flavæ, p. 5
Sebi ovilli, p. 11
previously melted together at a very moderate heat.

Steatinum Chlorali.

R Chlorali hydratis subtile
pulveratæ, p. 2
Olei olivæ, p. 5
Dissolve and mix thoroughly with
Sebi ovilli, p. 6
Cere flavæ, p. 7
previously liquefied.

Steatinum Chloroformi.

R Chloroformi,
Olei olivæ, aa p. 1
Mix and add to the following, previously melted together at a low temperature:
Sebi ovilli, p. 1
Cere flavæ, p. 2

Steatinum Iodatum.

R Iodi subtile triti, . . . p. 1
Spir. vini absoluti, . . . p. 3
Dissolve with the aid of heat, add
Olei ricini, p. 7
and mix with the following, previously liquefied:
Sebi ovilli,
Cere flavæ, aa p. 7

Steatinum Iodoformi.

R Sebi ovilli, p. 18
Ol. myristicæ expressi, . . p. 2
Iodoformi subtile pulv., . . p. 1
Dissolve with the aid of a water-bath.

Steatinum Mercuriale.

R Hydrargyri, p. 25
Ungt. hydrargyri (old), . . p. 5
Triturate until globules of mercury are no longer visible, then mix with the nearly cold mixture of
Adipis suilli, p. 22
Sebi ovilli, p. 10
Empl. plumbi solidi, . . . p. 18

¹ By careful melting deprived of water and glycerin.

Steatinum Opiatum.

R Sebi ovilli, p. 20
Olei ricini, p. 5
Styracis liquidi,
Elemi, aa p. 3
Bals. peruviani, p. 2
Melt together, keep in a water-
bath and decant. To the purified
mass, p. 25, add
Empl. plumbi solidi, . . p. 15
Extracti opii, p. 1
the latter previously dissolved in a
mixture of water 2 p., alcohol 1 p.
and glycerin 1 p.

Steatinum Piceatum.

R Piceis liquidæ, p. 12
Sebi ovilli liquefacti, . . p. 100
Digest in a closed vessel for a day
and decant.
In like manner prepare Steat.
cum oleo cadino and Steat. c. oleo
rusci.

Steatinum Piceatum Fortius.

R Piceis liquidæ, p. 1
Cere flavæ, p. 1
Sebi ovilli, p. 4
Prepare like the preceding.

Steatinum Sublimati.

R Hydrarg. chloridi corros, p. 1
Alcoholis, p. 10
Dissolve, add
Olei ricini, p. 50
and mix with the nearly cold mix-
ture of
Sebi ovilli, p. 900
Cere albæ, p. 50

Steatinum Thymolatum.

R Thymoli, p. 1
Olei olivæ, p. 5
Dissolve and mix with
Sebi ovilli, p. 190
Cere flavæ, p. 4

Steatinum Veratrini.

R Veratrini, p. 1
Spiritus, p. 10
Dissolve, add
Olei ricini, p. 15
Olei menthæ piperitæ
Olei lavandulæ, q. s.
and mix well with
Sebi ovilli, p. 75
Cere albæ, p. 10

*Steatinum Zinci Benzoatum more
Bellii.*

R Zinci oxidi, p. 1
Adipis benzoinati, p. 2
Sebi ovilli benzoinati, . . p. 4
M. sec. art.

Larger amounts of aqueous saline solutions cannot be permanently incorporated with cerates, and are apt to undergo decomposition with plasters. If incorporation of the dry salts be inadmissible, a mass of suitable consistence may be prepared from gelatin, glycerin and water, and applied by saturating with it muslin or gauze. Substances rendering gelatin insoluble cannot be applied in this manner.—*Berl. Klin. Wochenschr.*, 1881, No. 21; *Phar. Centralhalle*.

Unguentum Plumbi Hebræ is prepared by A. Popowski as follows: Finely powdered litharge 2 parts, olive oil 9 parts, and water 3 parts, are boiled together until the ointment is nearly white, when it is poured into a deep porcelain dish, and this is kept without disturbance at the temperature of a water-bath for 10 or 12 hours. The dish is then kept in a cool place; after solidification, the ointment is removed by slightly warming the dish, and the lowest and uppermost strata, which are impure, are removed. The pure middle translucent stratum is remelted without stirring, and poured into gallipots of suitable size; a layer of glycerin is poured upon the surface, and the ointment pre-
served for use in a cool place.—*Phar. Zeitsch. f. Russl.*

A Compound of Iodoform and Strychnia, $(C_{12}H_{22}N_2O_4)_3C_2HI_3$, has been obtained by Lextrait by dissolving 5 grams crystallized iodoform and 12 grams strychnia in 500 cc. of hot 85 per cent. alcohol. The crystals which are separated on cooling are insoluble in water, freely soluble in ether and chloroform, and at 15°C. dissolve in 98 per cent. alcohol to the extent of 3.40 grams per liter. The compound is readily decomposed, turns brown at 90°C., yields strychnia salts on being treated with dilute acids, and on exposure to light liberates iodoform and strychnia. Quinia and iodoform appear to form an analogous compound.—*Chem. Zeitung*, No. 21; *Compt. Rend.*, xcii, p. 1057.

Strychnia Hydrate.—On adding ammonia to a cold dilute solution of a strychnia salt, long, delicate, four-sided prisms are obtained, which on drying rapidly change to rhombic octahedrons or short rhombic prisms. E. Jahns considers the long delicate prisms to be a hydrate, which rapidly loses its water, forming anhydrous strychnia.—*Archiv d. Phar.*, March, 1881, p. 185.

Test for Atropia and Daturia.—Dioscoride Vitali recommends the following: Add to the substance a little fuming nitric acid, dry by the aid of a water-bath, and when cold add a drop of solution of potassa in absolute alcohol, when in the presence of as little as 0.000001 gram atropia or daturia sulphate a violet color will be produced, passing into bright red. Under the same circumstances strychnia produces a red and brucia a greenish color.—*Ibid.*; *L'Orosi*, 1880.

Estimation of Tannin.—A. Lehmann has obtained correct results by operating as follows: A quantity of the material containing from 0.2 to 0.6 gram tannin is boiled with water, and the decoction, including the material, reduced to 100 or 200 cc. Of the clear liquid 20 cc. are mixed with an equal bulk of concentrated solution of ammonium chloride, and then tested with the gelatin solution in the usual manner. The latter is prepared by dissolving one gram of gelatin in 100 cc. of solution of ammonium chloride, saturated in the cold, and is standardized with solution of tannin of known strength. The precipitate settles rapidly.—*Phar. Zeitschr. f. Russl.*

Calcium Chloride and Alcohol.—J. B. Heindle found this crystalline compound to have the formula $CaCl + 3C_2H_5O$ (which requires 55.42 per cent. of alcohol; Graham found 59 per cent.) Isobutylic alcohol, $C_4H_{10}O$, and amylic alcohol, $C_5H_{12}O$, yield analogous compounds.—*Chem. Ztg.*, No. 21; *Sitzber. Akad. Wien*, 1881, p. 61.

Iodal is obtained, according to A. Bertrand, on passing hydriodic acid into anhydrous chloral or bromal, with the liberation of chlorhydric or bromhydric acid. $C_2HCl_3O + 3HI$ yields $C_2HI_3O + 3HCl$. On dissolving the product in water and treating with potassa, iodoform is obtained.—*Ibid.*; *Moniteur Scient.*, ii, p. 493.

Iodine and Arsenic Sulphides.—On carefully heating equal molecules of arsenic disulphide, As_2S_2 , and iodine, R. Schneider observed rapid liquefaction to a brown-red liquid, congealing to an amorphous glassy mass of the same color, probably $AsI_3.As_2S_3$. Neither alcohol, carbon bisulphide or chloroform dissolves iodine.

Arsenic trisulphide and iodine, in the proportion of $As_2S_3 + I_4$, melt, likewise, to a red-brown liquid, which congeals to a somewhat crystalline scarlet-red mass, probably $2(AsI_3.As_2S_3) + 3SI_2$. This is readily soluble in hot carbon bisulphide, with a yellowish-brown color.—*Ibid.*; *Jour. prakt. Chem.*, xxiii, p. 486.

ILICIIUM RELIGIOSUM, SIEB.¹

Its Poisonous Constituent, and its Essential and Fixed Oils.

BY J. F. EYKMAN.

The *Illicium religiosum*, Sieb. (Jap. "Shikimi no ki"), a plant belonging to the family Winteræ, growing wild in Japan, is generally considered by the Japanese and Chinese, and indeed from the earliest times, to be a poisonous plant, and many cases of poisoning have been attributed to this plant, especially to its fruit. Last year, cases of poisoning also occurred at Leeuwarden, in the Netherlands, through the use of commercial star-anise in the preparation of "anise-milk."² According to a report of the commission which was charged with the investigation of the cause of the poisoning, star-anise fruit is said to have been used in the preparation of the beverage which corresponded in description to the fruit of the Japanese "Shikimi no ki."

The chemical investigation yielded nothing of importance. True star-anise gave 6.65 per cent. and the suspected star-anise 11.9 per cent. of resin soluble in ether, and the presence of an alkaloid, both in the genuine and the suspected fruit, was established by the general

¹Translated from the "Mittheilungen der Deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens," vol. xxiii (Yokahama, 1881).

²This beverage is ordinarily prepared from *Pimpinella Anisum*, less frequently from star-anise.

methods for the detection of poison of Dragendorff and Stas-Otto; this alkaloid, however, was not further investigated.

The symptoms following the administration of the suspected star-anise to different animals, such as dogs, consisted principally of irritation of the stomach, producing vomiting and some diarrhoea. Injection of the extract into frogs mostly caused death. In rabbits the symptoms were, shaking of the head, restlessness, sometimes moving in a circle, acceleration of the respiration, irregularity of the heart-beat, then clonic convulsion, especially in the hinder extremities; a paralyzed condition of the hinder extremities followed, leading to violent convulsions and death.

Recently several cases of poisoning have occurred in Japan, both from the fixed oil of the fruit used in the preparation of food and from eating "shikimi," and Mr. Sensai Nagayo requested the author to undertake a chemical investigation.

The essential oil was first examined; 40 kilos of fresh leaves yielded 177 grams or 0.44 per cent. of the oil, which was strongly light-refracting, nearly colorless, faintly yellow; when kept it became somewhat darker. In distillation, part of it sank in the water and part floated on the top; the mixture was heavier than water, and had a specific gravity of 1.006 at 16.5°C. The odor differed from that of ordinary anise and star-anise oil; smelling much more faintly of anise and otherwise difficult to describe exactly. It recalled laurel, camphor, cajuput and nutmeg, the last being especially perceptible in the distilled water. As to the peppermint-like odor which has been ascribed by some authors to the "shikimi" leaves, it was not observed either in the essential oil or distilled water or in the slightly bruised leaves.

When cooled in a mixture of ice and salt for some time, no solidification of the oil took place, or separation of stearopten, even at a temperature of -20°C. With a Hoffmann's polarimeter, the molecular rotatory power was found to be $[\alpha]_d = -8.6^\circ$.

By fractional distillation of 50 grams of the oil, about one-sixth was obtained as a terpene, boiling at 173° to 176°C., of spec. grav. 0.855, and rendered thick but not solid by gaseous HCl. About one-fourth was anethol, boiling point 231° to 233°C., molecular rotation 0°, spec. grav. 1.048 at 12°C., odor faintly anise-like. An extract-like residuum and resinified substance was also obtained.

The essential oil of "shikimi" mixes in all proportions with abso-

lute alcohol, chloroform, benzol, glacial acetic acid, carbon bisulphide and fixed oils. In petroleum spirit (b. p. up to 58°C.) it is somewhat difficultly soluble, and it requires of 78.5 per cent. alcohol about 3½ volumes for complete solution. Various reagents behaved towards this and allied oils as follows:

	Ol. Anisi vulgaris.	Oleum Fœniculi.	Ol. Anisi stellati.	Ol. Illicii religiosi.
Constituents.....	Chiefly solid and liquid anethol.	Small quantity of terpene boiling at 190°C., and liquid and solid anethol.	Chiefly solid and liquid anethol.	Rather much of a terpene boiling at 175° to 176°C.; liquid anethol boiling at 232° to 233° C.
Melting point.....	+6° to 18°C	-2° to -18°C.....	About 0°C.....	Not solid when cooled to -20°C.
Specific gravity.....	About 0.903.....	0.94 to 0.998.....	0.978.....	1.006.
Molecular rotation ..	0° to +0.5°.....	+13° to +19.6°.....	0° to -7.4°.....	-6°.
Alcoholic hydrochloric acid.	Colorless, afterwards reddish then pale red.	Colorless.....	Colorless.....	Colorless, afterwards blue.
Chloral reagent.	Colorless, afterwards yellow and brownish.	Colorless, then beautiful red.	Colorless, then beautiful red.	Colorless, afterwards dirty brown-yellow.
Ammoniacal silver solution.	In 24 hours no reduction.	Like ol. anisi vulgaris	Like ol. anisi vulgaris.	Reduction in a few hours.
Hager's reaction (oil 8 drops, H ₂ SO ₄ 30 drops; when cold, strong alcohol 10 cc.).	In alcohol, a portion of the sulphuric acid and oil mixture remains undissolved as a thick mass adhering to the sides of the tube.	Mixture of oil, sulphuric acid and alcohol is perfectly clear.	Like ol. anisi vulgaris.	Mixture is nearly clear; separation of a little reddish-white deposit.
10 drops of oil, with 60 drops of ether and about 0.150 gram of sodium.	Colorless; after 4 hours the mixture nearly colorless; deposit yellowish-white.	.....	Colorless; after 4 hours liquid and deposit yellow.	Colorless; quickly bluish; after 4 hours liquid pale yellow, deposit yellow.

Experiments on rabbits proved that the oil acts deleteriously in somewhat smaller doses than oil of anise, probably on account of the larger proportion of terpene present in it.

The fixed oil was prepared from the kernels (seeds?); the yield was 52.02 per cent.; proportion of kernels (seeds?) to the testa (capsules?) 58.6 : 41.4; fixed oil from "shikimi" seed at least 30.5 per cent.

The fixed oil was a clear, thick liquid, without any special smell, and had a pale yellow color, which upon warming the oil almost entirely disappeared. It had a specific gravity of 0.919 at 16.5°C. It dissolved in all proportions in petroleum spirit, chloroform, ether, benzol and carbon bisulphide; very slightly in cold absolute alcohol and glacial acetic acid, in about 15 parts of boiling absolute alcohol and 2.5 parts of boiling glacial acetic acid.

By experiments on dogs it was demonstrated that the "shikimi" poison is not an essential constituent of the oil, and consists neither of

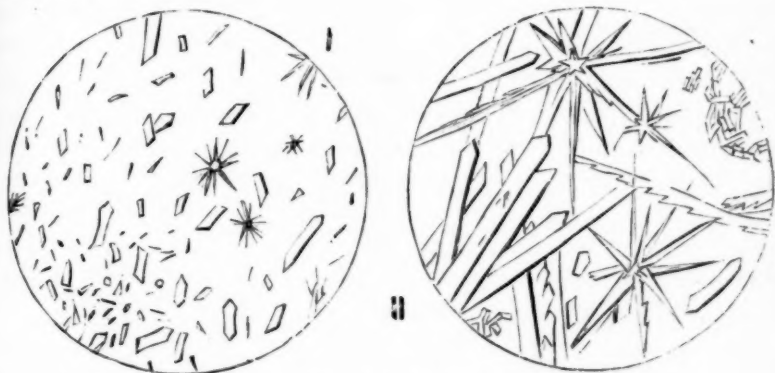
the free nor combined fat acids, as was thought by Geerts. The toxic property of the oil examined by Geerts must therefore be referred probably to the admixture of a small quantity of the active poison contained in the seed powder, which in the warm pressing passed into the oil; the large quantity of fat acids may probably have contributed to this.

Exhausting 8 grams of the seeds deprived of oil with 75 per cent. alcohol containing a little acetic acid, left about 5 grams of residue which produced not the slightest symptoms of poisoning, while one-fourth of the percolate had strong toxic effects. Lead acetate precipitates a tannin yielding a dark green-blue precipitate with ferric chloride, but does not precipitate the poisonous principle.

About 2.5 kilos of "shikimi" seeds, deprived from fat by petroleum spirit, were exhausted with 75 per cent. alcohol containing acetic acid. The percolate was evaporated; the residual extract was warmed with some glacial acetic acid, and to the mixture chloroform was added gradually until it caused no further separation. The chloroform solution, which was only faintly colored yellow, was filtered off, and the operation was repeated several times upon the residue. From the united liquid the chloroform was distilled off and the acetic acid evaporated; there remained an amorphous yellow residue, which physiological experiments showed to contain the poisonous principle. Suspended in warm water, it swam in it like clear yellow oil drops. Upon cooling, it became solid and gum-like and dissolved with difficulty in water. The aqueous extract showed a strong acid reaction, and gave a white turbidity with iodide of mercury and potassium. Heated with hydrochloric acid, a blue-violet to greenish color resulted, with the development of a characteristic odor. As after some time it showed no crystallization, a further purification was attempted.

As in the physiological experiment, the poisonous principle proved to be soluble in water, the amorphous residue was extracted with a little water, which left a considerable quantity undissolved. After filtration, it was shaken once with petroleum spirit, the separated watery liquid treated with potassium carbonate, and then shaken with chloroform. The chloroform, separated from the watery liquid, left upon evaporation a small yellow amorphous residue. Two small samples of this substance treated with dilute mineral acids, and left

for some time, showed under the microscope crystals, among which rhombic plates occurred.



ILICIIUM RELIGIOSUM. I and II, Crystals of Sikimin.

The entire quantity (1.5 gram) of amorphous substance was therefore treated with hydrochloric acid and placed in an exsiccator. The next day several wart-formed crystalline agglomerations had separated. Of these some were removed from the liquid and dissolved in boiling water and the filtrate, mixed with flesh and rice, given to a large dog. After ten minutes the ordinary symptoms were manifested; the stomach and duodenum were completely emptied by vomiting, but the dog died nevertheless, after strong convulsions, within an hour and a half.

The crystals consequently appear to contain the poison in a purer condition; but as they were still a little yellow they had to be submitted to a further purification. Nearly the entire remainder of the crystals was used, in order to obtain through repeated recrystallization from water a sufficient quantity of perfectly colorless crystals for physiological experiment.

About 12 milligrams of the crystals given to a young dog produced death after three hours. The crystalline principle was named *sikimin*.

The crystals are hard, heavy, dissolve with difficulty in cold water, better in hot water, ether and chloroform, easily in alcohol and glacial acetic acid, do not dissolve in petroleum spirit, nor in alkalies markedly better than in water. They do not reduce alkaline cupric solution, even at boiling temperature, nor after boiling with dilute sulphuric acid. The still somewhat impure crystals melt at about 175°C. If heated more strongly they become red-brown and diffuse

a peculiar odor and finally carbonize without leaving the least fixed residue. A small quantity submitted to sublimation between two watch glasses yielded a small quantity of oily sublimate, which did not crystallize from aqueous solution. The aqueous solution gave with iodide of mercury and potassium a faint turbidity which disappeared with excess. The solution in chloroform left on evaporation only an amorphous residue. In a small specimen no nitrogen could be detected.—Abstract from *Phar. Jour. and Trans.*, June 18.

THE BOTANICAL RELATIONS OF *ILlicium RELIGIOSUM*, *SIEB.*, *ILlicium ANISATUM*, *LOUR.*¹

BY J. F. EYKMAN.

The question as to the identity of the true star-anise, *Illicium anisatum*, *Lour.*, with the "shikimi," has been repeatedly discussed, but cannot be finally settled until the parent plant of the former is well known and has been carefully compared with that of the latter.

Probably it would not be undesirable if I add here some general remarks upon both plants.

JAPANESE PLANT.—*Illicium religiosum*, *Sieb.* (1837); *Illicium Japonicum*, *Sieb.* (1825); *Illicium anisatum*, *L.*, Jap. "Shikimi no ki"; "Hana Shik mi" ("Shikimi," also written "Sikimi" and "Skimi," appears to be derived from "Ashikimi" = Evil Fruit); "Moso"—*Chin.* "Mang-tsao."

According to Iwasaki Jose, author of the "Honzo Zofu," it is also called "Hana no ki" (in the province of Harima) and "Koshiba" (in the province of Enshu = Totomi).

According to Yamamoto Boyo, author of the "Hiakushinko" (Description of a Hundred Drugs), *Illicium religiosum*, *Lour.*, both in China and Japan, is called "Dai ui Kio." According to Ito Keisuke it is also called "Irisshi ya mu."

Illicium religiosum, *Sieb.*, has been imported into Japan from China, and probably also from the Korea, since the earliest times of the Buddha priests. In the present day it is still looked upon as a sacred plant, and therefore often cultivated near Buddhist temples, and displayed in consecrated vessels at religious feasts. It is also found near graves, a use which is due to the general veneration for it,

¹Translated from the "Mittheilungen der Deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens," vol. xxiii. (Yokohama, 1881.)

Am. Jour. Pharm. }
Aug., 1881. }

Illicium Religiosum and Ill. Anisatum.



perhaps also on the ground that as a poisonous plant it has the reputed power to keep insects, etc., at a distance from the dead.

The powder of the bark and leaves also is used in long thin cylindrical pastilles ("sen-ko") as incense in the Buddhist temples and in religious services. Formerly such straight or circularly bent cylinders, which when lighted burned regularly, were used as time measures.

The plant grows wild now in Japan everywhere, on the mountains and in the valleys. It was found in the neighborhood of Nagasaki (Oldham), in the centre of Nippon, near Tokio (Thunberg), upon the Iwaya mountains (Siebold), near Yokosuka (Savatier), in large quantities upon the island of Hachijo, in the province of Izu (Iwasaki Jose), and in the provinces of Sagami, Enshu, Tamba, Musashi, Hizen, Chozhu, etc.

The plant attains a height of from 6 to 20 feet. The leaves are shortly (about 1 centimeter) petioled, coriaceous, thick, feel waxy to the touch, evergreen, oblong or oblong obovate, acuminate, cuneate at the base, entire at the margins, free from hairs (like the whole plant), about 7 centimeters long and 3 to 4 centimeters broad. The flowers open in the spring, about April. The petals are greenish or very slightly yellowish white, and have a wax-like appearance; they are from 1 to 3 centimeters long, 0.5 centimeter broad, and 12 to 20 in number. The stamens are 15 to 20. The fruit consists of about eight carpels, arranged side by side in a closed circle, which attains a diameter of 2 to 3 centimeters and a depth of 0.5 centimeter. Each carpel has on the upper side the persistent pistil. In the unripe condition the fruit is green, juicy, and contains much essential oil. When it commences to ripen, in the autumn, the carpel rapidly dries up, especially upon the dorsal side, shrivels, and becomes a red-brown color.

When ripe the fruit opens rapidly lengthwise along the upper side. I have frequently observed that the yellow-brown seeds, which are about 0.7 centimeter long, and 0.5 centimeter broad, provided with a hard testa, and occur one in a carpel, are hurled out with considerable force, often to a distance of three or four meters.

The bark of the tree has, as usually stated, an aromatic smell that is not disagreeable; the fruit, on the contrary, has a less agreeable odor and an unpleasant taste. The seed kernel tastes sweetish. The leaves smell like the essential oil present in them.

All parts of the plant are looked upon as poisonous by the Japanese, especially the fruit.

The "shikimi no ki" is indigenous in China, and grows there also in the valleys and on the mountains. It is called by the Chinese "Mang-thsao" (*mang* = mad; *thsao* = herb: Jap. "*moso*"), because it is said to cause paroxysms of frenzy in human beings.

The different parts of the plant are used in China similarly as in Japan. According to the "Penthsaokang-mu" (Chinese Natural History), the dried leaves are used in medicine. Powdered and mixed with rice or barley flour, they are used to kill fish, which, however, form an innocuous food.

TRUE STAR-ANISE.—*Illicium anisatum*, *Lour.*; *Anisum peregrinum*, *Bauh.* Chin. "Hwai hiang" (Jap. "Kai-Ko"); "Pah-ko-hwui-hiang" (Jap. "Hakkaku uikio" = octagonal anise).

"Ta hwui hiang" (Jap. "Dai uikio" = greater anise, to distinguish it from "Sho uikio" = smaller anise = *Foeniculum vulgare* or *Anethum graveolens*, in Jap. "Inondo," and Chin. "Jira").¹

In Japan the true star-anise is also called "Haku uikio" (= foreign anise).

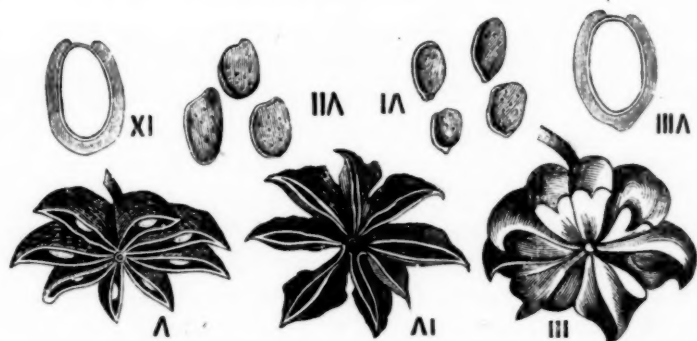
This plant is indigenous in Cochin China, Siam and the southwest provinces of China, as Yunnan. The fruit of this plant, the true star-anise, is imported into China and Japan. To Europe and India it is generally sent *via* Hong-kong.

According to Rondot, the best kind is brought from Foukien to Canton and from thence exported through Tsiouen-tchou-fou. The fruit is also collected in Kiang-si and Kuang-tung. A perfectly exact description of this plant is at present wanting. It is said (Loureiro) that it differs from the Chinese and Japanese *Illicium religiosum*, *Sieb.*, in its inferior height (about 8 feet), its smaller and more oval leaves, which are not, like the "shikimi," acuminate at both ends, but rounded, and in its greater number of stamens (up to 30). The fruit of the true star-anise differs from that of the Japanese in its distinctly sweetish agreeable, strong anise- or fennel-like odor and taste, and further in not being poisonous.²

¹ Older naturalists probably also name *Foeniculum vulgare* (Jap. "Kure-no-omo") "Dai-ui-kio." Li-si-chin, a Chinese naturalist, calls only the fruit of *Foeniculum vulgare* exported from Nehia "Dai-ui-kio"; all other commercial kinds of *F. vulgare* he calls "Sho-ui-kio."

² The Leeuwarden Commission states upon this point that the injection of the extract of the true star-anise into frogs and rabbits did not induce the slightest abnormal symptoms.

Distinctions in odor, taste, chemical composition (the different amounts of fats present, the poisonous constituent, etc.), and physiological action, cannot, from the point of view of the systematic botanist, contribute to characterize two plants as different species, since these properties, which possibly are due only to quantitative differences, may depend upon climatic conditions. Yamamoto Boyo, author of the "Hiakushinko" (1843), remarks upon this as follows: "The Japanese fruit resembles exactly the 'hakkaku uikio' (true star-anise) except in the smell; this difference is, however, a result of the influence of locality and climate, exactly as in the case of Chinese cinnamonum. Planted in Japan this tree loses its pungent taste and acquires moreover the aroma of 'shikimi.'" There remain consequently only the few morphological differences.



ILlicium RELIGIOSUM.—III, Unripe Fruit. IV, Ripe Fruit. VI, Seeds. VIII, Section through the testa.
 ILlicium ANISATUM.—V, Fruit. VII, Seeds. IX, Section through the testa.

The author refers to the characters given by different writers for distinguishing the fruits of the two trees, and shows that the differences are probably connected with the age, the manner and time of collection, the conveyance, climate, etc. Meanwhile we cannot go further than to consider the Japanese "shikimi no ki" as a poisonous—probably only as a more poisonous—variety of *Illicium anisatum*, *Loureiro*.

But from a hygienic point of view a distinction must be made between the Japanese and Cochin China star-anise as a commercial drug. For pharmacognostically distinguishing the true star-anise from the fruit of "shikimi" the following characters can be taken in consideration :

TRUE STAR-ANISE.

Taste sweet, anise-like; odor faintly of anise.

Somewhat larger than "shikimi" fruits. Surface more resembling cork. Beak short, horizontal, or slightly bent upwards, pointing outwards. Carpels less woody, shriveled in one upon another, and wrinkled. Seed mostly dark brown with rounded apex.

SHIKIMI FRUIT.

Disagreeable taste, not sweet or like anise. Smell not like anise, but faintly resembling laurel, clove and nutmeg.

Somewhat smaller than true anise. Surface more shining, red-brown. Beak thin, frequently bent strongly upwards or crooked backwards. Carpels more woody, much shrunk in upon one another, wrinkled. Seed mostly yellow-brown, with a stout keel and a raised apex.

—Abstract from *Phar. Jour. and Trans.*, June 25.

BORNTRÆGER'S ALOES TEST.

BY RICHARD H. GROVES.

Read before the School of Pharmacy Students' Association, June 9, 1881.

This test, proposed by Hugo Borntræger, appeared in the "*Zeitschr. für anal. Chemie*," vol. xix, p. 165, 1880. It is there described as being an easy and very delicate test by which 1 part of aloes in 5,000 can be detected. The mode of operating is as follows: A little of the suspected liquor is well shaken with about twice its bulk of benzin, which is allowed to separate, and, being carefully decanted, is shaken with a few drops of strongest solution of ammonia; this is again allowed to separate, when, if aloes be present, the ammonia solution will be of a beautiful clear red color. In the case of solids, a cold alcoholic solution is made and treated in the above manner.

Thinking that the color might be due to aloin, I tried the test on some barbaloin, but obtained only a very slight pink color, which was probably due to the occurrence in the aloin, as an impurity, of traces of the substance giving the color. This being the case, the next thought that presented itself was whether all the varieties of aloes would furnish the reaction, and if so to what extent in each case.

The test was accordingly tried on alcoholic solutions of six different varieties of aloes, namely, Barbadoes (1st and 2d quality), Socotrine, hepatic, Cape and Natal. The solutions tested were of 40 per cent., 10 per cent., 5 per cent., 2 per cent. and 1 per cent. strength. In the stronger solutions the color was too intense for the gradual lessening of color to be well seen, nevertheless the 2d quality Barbadoes was always the darkest and the Natal the lightest. The following table

represents the results obtained with a 1 per cent. solution, the aloes being arranged according to the intensity of the color obtained.

Variety of Aloes.	Results.
Barbadoes (No. 2)	Very red.
Barbadoes (No. 1)	} Not quite so red as the former.
Socotrine,	
Cape,	Red with a tinge of brown.
Hepatic,	Red.
Natal,	Very slightly red with a tinge of brown.

The color given by the Natal aloes was so slight that the test would not be at all reliable in more dilute solutions than 1 per cent. The test was also tried on a solution of 1 part 2d quality Barbadoes in 250, but the color obtained was not sufficiently distinct to be relied upon as a test. The color of the benzin solution in each case was greenish-yellow, that which had been shaken with the Natal and hepatic aloes being the lighter.

The idea naturally occurred that it was quite likely that some bodies analogous to aloes would behave in a like manner. Borntræger states that he tried the test on preparations of logwood, wormwood, cinnamon, pimento, colocynth, sweet flag, liquorice, juniper fruits, burnt sugar, etc., but obtained no reaction.

Czumpelik ("Chem. Centralbl.," 1866, p. 29) has pointed out that aloes contains a tannin-like body, and this suggested the application of the test to tinctures of catechu and kino. After shaking with benzin, half was used whilst in a slightly opalescent condition, and gave a bright red color similar to that produced by the aloes, but the remainder, which was set aside for a day to get perfectly clear, gave a very pale yellow color without any trace of red.

Tannic acid is a known reagent for the detection of alkalies ("Zeitsch. für anal. Chemie," vol. xx, p. 234), and one drop of strong tincture of catechu in a test-tube full of water gave a bright red color with strong solution of ammonia. This being the case, it points to the necessity of always allowing the benzin to become *absolutely* clear before decanting, and great care must be taken that no little globules of the solution are remaining on the surface of the benzin or attached to the sides of the tube, for if the liquid contain tannin a red color will certainly result. The results of my experiments point to the following facts:

First—That the test could not be relied upon in solutions in which Natal aloes might be present, having a less concentration than 1 per

cent., and that in no case can it be used in solutions as dilute as 1 part in 250.

Secondly—That the color is not due to aloin, and if due to a tannin-like substance it must be a variety which is soluble in benzin.

Thirdly—That extreme care must be taken when employing this test for the detection of aloes, that the benzin layer is perfectly clear before decanting from the underlying liquor.

The foregoing experiments were carried out in the laboratories of the Society's School of Pharmacy.—*Phar. Jour. and Trans.*, June 18, 1881.

ON NEW ZEALAND KAURI GUM.

BY EDWARD H. RENNIE, M.A. (Sydney), B.Sc. (Lond.)

This resin, which is the product of a coniferous tree (*Dammara australis*) growing in New Zealand, seems to have been first examined in 1843, by R. D. Thomson ("Ann. Chim. Phys." [3], 9, p. 499), who obtained from it, by distillation at a gentle heat, an amber-colored oil containing 82.2 per cent. carbon and 11.1 per cent. hydrogen, to which he gave the name *Dammarol*.

It was again examined in 1874 by M. M. P. Muir (this Journal, 1874, p. 472), who obtained from it, by dry distillation, an oil boiling between 155° and 156°, which contained 79.07 per cent. carbon and 10.90 per cent. hydrogen, to which he ascribed provisionally the formula $C_{10}H_{20}O_7$, stating, however, that the quantity at his disposal was too small to make certain of the purity of his product. Having a considerable quantity of the Kauri gum at my disposal, I have thought it worth while to re-examine it, especially with regard to the volatile oil above mentioned.

The resin exhibited physical properties very similar to those described by previous observers. It was thought better, instead of subjecting it to dry distillation, to place it in a copper vessel which was heated by a gas flame, and through which a rapid current of steam was kept passing. The distillation was continued until a semi-solid sticky product began to form in the condenser. In this way 15 lbs. of the resin yielded about 750 cc. of oil. The latter, having been separated from the water, was fractionally distilled. A very small quantity came over below 156°, the greater part coming over between this temperature and 160°. A small quantity came over between

160° and 180°, but above this latter temperature scarcely anything more could be got to distil over, even in a vacuum; the residue, when cold, being a sticky, gelatinous mass. On repeated fractionation, nearly the whole of the oil came over between 157° and 159°, very small quantities being obtained from 160° to 170° and 170° to 180°. The portion from 157° to 159° was distilled three times over sodium (which acted very slightly upon it), and was then found to boil almost constantly between 157° and 158°. This final product had a strong odor of turpentine, and was perfectly colorless.

On combustion it yielded the following numbers :

- I. 0.2358 gram substance gave 0.2545 H₂O and 0.7600 CO₂.
- II. 0.1290 gram substance gave 0.1428 H₂O and 0.4180 CO₂.
- III. 0.2160 gram substance gave 0.2322 H₂O and 0.6954 CO₂.
- IV. 0.1970 gram substance gave 0.2126 H₂O and 0.6344 CO₂.

These corresponded with the following percentages:

	I.	II.	III.	IV.	Required for C ₁₀ H ₁₆ .
Carbon, . . .	87.91	88.37	87.80	87.82	88.23
Hydrogen, . .	11.99	11.29	11.94	11.99	11.77

The liquid had a specific gravity of 0.863 at 18°, and in a column of 300 mm. in length acted very slightly on polarized light, giving a rotation to the left of 3 or 4 degrees.

By the action of phosphorus pentasulphide for 7 to 8 hours it was, for the most part, resinized, but a small quantity of liquid distilled over below 190°. This, by repeated distillation over sodium, treatment with strong sulphuric acid and fractionation, yielded a liquid boiling at 174° to 178°, which had the odor, external characteristics and composition of cymene, and, on oxidation with chromic liquor, yielded terephthalic and acetic acids.

Attempts were made to isolate some other substances from the higher-boiling portions of the original oil, but on fractionation they all tended to a higher and lower limit, the latter being about 160° and the higher above 200°; and, as already stated, the portions above 200° seemed to polymerize and form only a sticky mass, which would not distil even *in vacuo*.

From the above facts, it appears that the oil produced in the distillation of Kauri gum consists almost entirely of a terpene, boiling at 157° to 158°, and closely resembling the other members of the same family in its physical and chemical characteristics; the higher-boiling portions of the original oil being apparently formed by polymerization.—*Jour. Chem. Soc.*, May, 1881.

ARTIFICIAL FORMATION OF INDIGO.

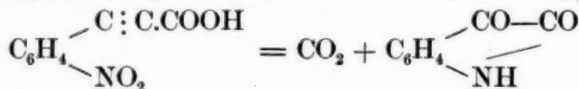
Relation of Cinnamic Acid to the Indigo Group.

BY A. BAEYER.

After giving a short historical sketch of the different steps which led to the discovery of the artificial formation of indigo, the author describes the preparation of indigo-blue from cinnamic acid. *Orthonitrocinnamic acid*, $C_9H_7NO_4$ (m. p. 240°), is best prepared by the process described by Beilstein and Kuhlberg ("Ann.," 163, p. 125), which converts about 60 per cent. of the cinnamic acid into the orthonitro acid. The ortho- and para acids are separated by means of the difference of their solubility in ether. Ethyl orthonitrocinnamate forms rhombic crystals ($a:b:c=0.9265:1:0.5174$) which melts at 44° . This ortho acid can easily be identified by the blue color which is produced when it is dissolved in warm sulphuric acid. *Dibromonitrocinnamic acid*, formed by the direct addition of bromine to the nitro acid, crystallizes in colorless needles or plates, which melts at 180° with decomposition. The crystals are soluble in hot water and in benzin. The ethyl and methyl salts of this acid melt respectively at 110° and 98° . When a solution of the dibromo acid in caustic alkalis is gently warmed it changes into orthonitropropionic acid and isatin. Indigo-blue is also formed if the solution is boiled, and if zinc-dust is added to the mixture indole is produced.

If a solution of dibromonitrocinnamic acid in excess of caustic alkali is allowed to stand for some time, and an acid is then added, a white precipitate of *orthonitrophenylpropionic acid* is thrown down. The acid may be obtained in colorless needles by careful recrystallization from hot water; it melts at 155° with decomposition. The potassium and sodium salts of this acid are freely soluble in water, but much less soluble in the presence of free alkali. The silver salt explodes when heated. The ethyl salt is deposited from an ethereal solution in large tables (m. p. 60°).

Orthonitroacetylene, $C_8H_5NO_2$, is prepared by the action of water at 150° on nitrophenylpropionic acid, or by boiling an aqueous solution of the acid in a flask provided with an upright condenser. The product is distilled in a current of steam, and the nitroacetylene purified by recrystallization from alcohol. It forms colorless needles (m. p. 81°) which acquire a yellow color on exposure to light. The crystals dissolve freely in hot water and in most solvents. An ammoniacal solution of silver nitrate yields a yellowish-white, and ammoniacal cuprous chloride solution forms a red precipitate with nitroacetylene. On reduction with zinc-dust and ammonia an oily base is produced, which has the peculiar odor characteristic of the indigo vat. The decomposition of orthonitropropionic acid by the action of a hot solution of potash may be advantageously employed as a method for preparing isatin, 86 per cent. of the theoretical yield being obtained.



On the addition of a small quantity of grape-sugar to a hot solution of the propiolic acid in dilute potash needle-shaped crystals of pure indigo-blue, free from indirubin, are deposited. This method yields a better result than is obtained by the direct production of indigo from orthonitrodibromocinnamic acid.

Orthonitrophenylechlorolactic acid, $C_9H_5ClNO_5$, is formed together with orthonitrochlorostyrol when chlorine is passed into a solution of orthonitrocinnamic acid in dilute soda solution. The bye-product is removed by filtration, and the filtrate acidified and extracted with ether.

The residue obtained by evaporating the ethereal extract is dissolved in benzin and the solution mixed with light petroleum, when the chlorolactic acid is precipitated as a white crystalline mass (m. p. 119°). This acid is converted into indole by reduction with sodium amalgam or with ferrous sulphate in an alkaline solution.

By the action of alcoholic potash it is converted into *orthonitrophenyl-oxyacrylic acid*, $C_9H_7NO_5$. When slowly heated orthonitrophenyloxyacrylic acid begins to melt at 110° with decomposition, carbonic oxide and indigo-blue being formed. This acid is also split up by continued boiling with water or dilute sulphuric acid.—*Journ. of Chem. Soc.*, May, 1881, from *Ber.*, xiii, p. 2254-2263.

VARIETIES.

TUPELO TENTS FOR DILATING THE UTERUS.—Dr. Landau ("Medical Times and Gazette," vol. i, 1881, p. 327; from "Volkmann's Samml. Klin. Vorträge"), in a lecture on methods of dilating the cervix uteri, strongly recommends the tupelo tent, made from the root and stem of the *Nyssa aquatica*. He says these tents expand more uniformly than laminaria tents, and their coefficient of expansion is somewhat greater than that of any other tent. In expanding they produce the same softening and infiltration of the uterine tissues as other tents. They do not tend to septic infection; and therefore antiseptic precautions need not be rigidly carried out where they are used. One tent may be kept in three or four hours, and then replaced by another. The cavity of the uterus may thus be made accessible to the finger within twenty-four hours. In two years' use Dr. Landau has seen no ill effects from their employment.—*Phila. Medical Times*, June 4.

SLIPPERY ELM ROOT DILATORS.—Dr. L. B. Tuckerman, of Austinburg, Ashtabula county, O., gives the following information about the making of these dilators in the Boston "Med. and Surg. Journal," Jan. 13, 1881: "The fresh root is cut into lengths, and can be bent at any desired curve, and thus dried. When thoroughly dry, the rough exterior is scraped off. The end is dipped about two inches into water, and heated over a lamp. A series of parallel longitudinal cuts is then made, nearly perpendicular to the bark, and through it to the wood beneath. The cuts are from one-eighth to one-twelfth of an inch apart, and reach from the end of the stick

about one inch to an inch and a half back. The end, so far as the cuts run back, is again dipped into water and heated. The strips of bark made by the cuts are lifted from the wood, care being taken not to break them from their attachment at their base. They are again dipped and heated, when they can be bent back at right angles, to allow the end of the wood to be cut off nearly as far back as the bark is slit up. The end of the wood is trimmed to a conical shape. It is again dipped and heated, and with a strong twine the bark, now a hollow cylinder, is wound down firmly to the conical end of the wood, and beyond it into a solid cylindrical tip. When thoroughly dry, the tip is rounded and the whole surface of the root finished with sand-paper. It is ready for use by soaking about five minutes in carbolized water.

"If it be desirable to use the same dilator again, it is to be wiped immediately after using, and when dry finished again with sand-paper. This can be repeated so long as the tip remains. The smaller sizes can be bent when seasoned, by wetting and heating, but not so readily as when green. The roots are almost perfectly cylindrical, and are found of any size from two inches in diameter down."

AN EXHILARATING MIXTURE. — Professor Luton, of Rheims, relates ("Bulletin de Thérapeutique") that having administered to a patient a mixture of tincture of ergot and of phosphate of sodium, he was greatly surprised to find it after a while produce the most exhilarating effects, exciting loquacity and irresistible laughter, which lasted for several hours and much resembled the slight intoxication produced by light wines and champagne. The mixture was tried on some other persons, always with the same effects, these being producible, however, only in women, especially those of a nervous temperament. Men resist its effects, probably requiring, as the author supposes, stronger doses in consequence of their being more accustomed to alcohol. The formula employed in the production of these curious effects was for a medium dose, in a person sufficiently excitable, as follows: Tincture of ergot five grams, and solution of phosphate of sodium (at one-tenth) fifteen grams. This is poured into a little sugared water and taken fasting. As a therapeutical agent, Prof. Luton suggests that it might prove useful in some cases of hypochondriasis and in the algidity of hysterical subjects and those who are very liable to spasm. The algidity of the early stage of fever or cholera might also be favorably influenced. So also in various cases of anemia and adynamia, the mixture, in reduced doses, so as not to excite excessive hilarity, might prove useful. — *Med. Times and Gazette; Louis. Med. News*, June 18.

FUMIGATION IN ASTHMA. —

R Potassii nitratis,	
Pulv. anisi,	aa ʒss
Pulv. stramon. fol.,	ʒi M.

A thimbleful of the powder, placed on a plate, is pinched into a conical shape and lighted at the top. It is then held near the patient, who inhales the fumes. This is a celebrated London "anti-asthmatic powder" — *Med. and Surg. Rep.*, July 9.

PIAZZA'S FLUID IN NÆVI.—The composition of this caustic fluid is:

R	Ferri chloridi,	3viss	
	Sodii chloridi,	3iiiss	
	Aquæ destill.,	3ii	M.

A single drop of this is injected by M. de Saint Germain into nævi, and repeated at intervals of eight days. Each injection produces a small scar, and the operation is only complete when the whole surface of the nævus has been transformed into a scar.—*Ibid.*

SOME RECENTLY DISCOVERED MEDICINAL PLANTS.—If a very little of what is heralded as the medicinal virtues of plants turned out true, it would be a most gratifying fact. However, it is well to record all for trial.

Hieracium venosum.—Observations are given by Dr. W. Stump Forwood in the "Quarterly Transactions of the Lancaster (Pa.) Medical Society," April, 1881, to show that this may prove of value in phthisis. At least, it seems to have a well-deserved reputation for that disease among cattle. The infusion is used.

Euphorbia villosa.—In the Ukraine and Galicia this plant is said to be regarded as an unfailing remedy against hydrophobia, provided it is taken within five or six days of the infection. Unusually good evidence seems to be in its favor.—*Allg. Med. Cent. Zeitung*, March 26, 1881.

Convallaria majalis.—Clinical and physiological experiments with this herb are reported in the "Centralblatt für Klin. Med.," by Dr. Bojojawlensky and Troitzky (No. 47, 1880; No. 1, 1881). In organic heart disease its effects equal those of digitalis; the urine is increased, serous deposits are rapidly absorbed, nervousness is diminished; cumulative effects were not observed.—*Med. and Surg. Rep.*, June 4.

ADVANCE IN THERAPEUTICS IN 1880.—New remedies many, a few good, many bad, most indifferent. Tonga valuable in facial neuralgia; sulphide of calcium in suppuration—its action marked and reliable, grain doses now admitted; the nitrites of potassium and sodium have the action of amyl nitrite, but milder; ergot (again?) found useful in diabetes; pilocarpin useless in hydrophobia, which still defies all treatment; this last drug, tried in many directions, gave meagre results; benzoate of sodium commended in scarlet fever and gonorrhœal ophthalmia; salicylate of sodium, according to Dr. Greenhow, mitigates but little the complications of rheumatic fever, while it may be a positive injury to the heart; salicin is inefficacious, while salicylate of quinia is highly praised by Dr. Hewan; the value of cold baths in typhoid fever have become more than doubtful.—*Chicago Med. Jour. and Exam.*, April.

IMPROVED DOVER'S POWDER.—Dr. H. D. Vosbough, of Lyons, writes: "After trying various compounds, I have for several years used the following with results entirely satisfactory.

"In order to keep gum camphor in a perfect powder I grind it with an equal bulk of the English creta præparata; this I dispense as pulverized camphor. Now, my Dover's powder is compounded as follows, viz.:

R	Opii pulv.,	
	Ipecac pulv.,	aa 3i
	Potass. nit. pulv.,	3iv
	Pulv. camph. (prepared as above noted),	
	Rad. glycyrrhizæ pulv.,	aa 3ii M.

"This seems to me a better anodyne, a better sudorific and a better hypnotic than any other compound I have ever seen called Dover's powder."
—*N. Y. Med. Record.*

PSYLLIUM SEED IN CONSTIPATION.—We read in "Paris Medical" that Mr. Noel Gueneau de Mussy proposes using psyllium or sarragota seed, besides white mustard seed, the use of which is excellent, or flax seed in the natural state.

Psyllium is a species of plantain, commonly called fleawort, because of the appearance of its seeds, which are quite small and very mucilaginous. A tablespoonful in half a glass of water is taken before dinner. He says that with a number of persons this method has proven as successful as with the Spanish lady, from whom he obtained it. In other cases, however, he was obliged to alternate with more powerful laxatives, such as aloes or rhubarb, so as to keep up the effects. It is probable that psyllium seed, like others of its kind, is not persistent in its effects, although in a number of cases it seems to have been so.—*Med. and Surg. Reporter.*

BORACIC ACID IN SURGERY.—The use of boracic acid in surgery has shown it to be a drug of greater power and wider range of applicability than was formerly supposed. It is used with success on old sores and ulcers, both simple and specific, and also in the treatment of large suppurating wounds and abscesses it has been found of especial value. In ozena and otorrhea it acts as a prompt deodorizer and alterative, lessens the discharge and promotes healthy action. As a lotion in chronic cystitis and chronic inflammation of mucous membranes in general it has a decidedly beneficial action.—*Southern Med. Record*, Jan. 20.

BORACIC ACID FOR CHOLERA.—The London "Lancet" calls attention to the value of boracic acid in cholera, as exhibited in the cases treated by Surgeon Butler, of the Madras Medical Service. It was, it appears, at the period when the properties of boracic acid were first made public that Dr. Butler determined to try its effects in this direction. The pure acid not being procurable, the baborate of sodium (borax) was at first employed, and with marked benefit, the percentage of recoveries being from 70 to 75 per cent. Subsequently, he used the pure acid in 10 grain doses every two hours, combined with borax or baborate of sodium, under which treatment every case recovered. Dr. Butler further asserts that in no case were any signs of irritation or ill effects observed from the remedy, and in all of them the renal section was re-established with much greater facility than under any other method.—*Southern Med. Record.*

HYDROBROMATE OF MORPHIA.—Dr. Landrieux ("La France Médicale") employs this salt in solution to one-fiftieth, and injects from 5 to 10

and 20 milligrams a day. More soluble than the hydrochlorate of morphia, it may be used in half doses, is more sedative, and does not give rise to the sort of purulent diathesis frequent after repeated injections of hydrochlorate.—*Chicago Med. Jour. and Exam.*, April.

APO MORPHIA IN CAPILLARY BRONCHITIS.—Dr. E. Kormann claims that apomorphia should be administered as follows: Children one year old are given one-sixth of a grain every hour or two, this being increased one-twentieth of a grain for each year. In seventy-six cases of capillary bronchitis the effect of the remedy was very marked. In some cases the remedy was not well borne and a slight degree of collapse followed the vomiting, with dilated pupils, which did not react upon exposure to light. A diminution of the pulse was also observed. Since it exerts no disturbing influence on the stomach it is, in the opinion of the author, our most valuable expectorant.—*Chicago Med. Review*, 1881, p. 132.

CARBOLATED CAMPHOR IN DIPHThERIA.—In a recent number of the "Presse Médicale Belge," Dr. Souley claims to have met with great success in the treatment of diphtheria by local applications of the following mixture: Acid carbolie nine parts, camphor twenty-five parts, alcohol nine parts, and olive oil thirty-five parts; a camel's hair pencil is dipped in this mixture and applied to the affected part every two or three hours, and in the course of some days every four or five, according to the extent of the improvement. The local applications are made over the whole extent of the false membrane. In children difficult to manage the throat is well swabbed with a camel's hair pencil well steeped in the mixture. The mixture has an exceedingly disagreeable taste, but the patients soon become accustomed to it. The use of this by atomization seems likely to be of more value.—*Chicago Med. Review*, 1881, p. 132.

JUGLANS NIGRA IN DIPHThERIA.—Dr. C. R. S. Curtis, of Quincy, Ill., reports to the Boston "Medical and Surgical Journal" of March 10 the results of his trials of black walnut leaves in the treatment of diphtheria. He was led to employ them by reading of Néaton's success with the leaves and bark of the European walnut as a topical application in malignant pustule. Not having access to the European species, he substituted for it a strong decoction of the leaves of the native black walnut in a bad case of diphtheria, to be used as a gargle, and, to his agreeable surprise, with very good effect. Since then he has used the remedy in about thirty cases, many of them bad ones, and all have recovered, a result he is inclined to attribute in great part to the walnut decoction. He has used the remedy in the form of a preventative, in spray with the atomizer, as well as in a gargle. Besides the leaves he employs the hulls of the green walnuts, which make the decoction still stronger, and he finds it not painful or especially disagreeable to his patients. The remedy is so readily accessible to most physicians that further reports may be expected as to its utility in diphtheria and allied troubles.—*Chicago Med. Rev.*, April 5.

JAMAICA DOGWOOD.—The use of Jamaica dogwood as a substitute for opium has been highly recommended by those who have investigated its properties. It is more decidedly hypnotic than opium, produces no anorexia headache and does not constipate the bowels or interfere with digestion. It acts rapidly, but its effect is less durable than opium, and requires to be given more frequently. The dose is 20 minims of the fluid extract every three hours.—*Southern Med. Record.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE KANSAS PHARMACEUTICAL ASSOCIATION held an adjourned meeting at Topeka July 13, Mr. R. J. Brown, President, in the chair. A report was read by Mr. G. Eddy, giving the result of the recent test cases under the prohibition law of the State. A delegation was appointed to represent this body at the meeting of the American Pharmaceutical Association, and Mr. Leis reported that the arrangements for an excursion to Santa Fe had been perfected.

The following officers were elected for the ensuing year: President, R. J. Brown, Leavenworth. Vice Presidents—B. W. Woodwad, Lawrence; W. C. Johnston, Manhattan. Secretary, F. E. Holliday, Topeka. Assistant Secretary, W. A. Nayler, Holton. Treasurer, J. G. Northcraft, Abilene.

At the evening session five papers were read and discussed, after which the association adjourned.

PHARMACY IN MISSOURI.—The following gentlemen comprise the State Board of Pharmacy under the law recently passed: M. W. Alexander, St. Louis; J. F. Hurt, Columbia, and G. A. Howard, Booneville.

EDITORIAL DEPARTMENT.

THE NEXT ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, which will convene at Kansas City, August 23d, promises to be very largely attended, not only from the Western States, but on account of the low railroad fares at present prevailing a large number of delegates and members from the Atlantic States will undertake the journey. The round trip from New York, Philadelphia and farther south will not exceed in cost \$28. Two routes have been selected, one passing by way of Niagara Falls through Canada, the other through Washington City, along the Potomac and crossing the Alleghenies into the Ohio Valley, stopping over night at the Grand Hotel, Cincinnati, and over Sunday at the Southern Hotel, St. Louis. The various lines between St. Louis and Kansas City offer very low fares, and special accommodations have been

offered by the Chicago and Alton Railroad, both from Chicago and St. Louis. Reclining chairs will be provided for all who, going by way of Chicago, will notify Mr. R. H. Cowdrey, of that city, and those going by way of St. Louis notify the Permanent Secretary. These trains are also provided with hotel cars. The fare for the round trip between Chicago and St. Louis will not exceed \$10. Particulars concerning the reduction secured by the Local Secretary, Mr. William T. Ford, may be obtained by addressing him; these reductions from the regular fares apply to all, or nearly all, the railroads west of the Alleghenies, and are secured for the return trip upon a certificate from the Local Secretary.

This will be the second time the Association will meet in the Mississippi Valley. Since the very successful meeting in St. Louis, in 1871, ten years have elapsed, and the Association, very properly, enters upon new territory, several hundred miles further west, to hold its meeting on the western border of Missouri; and with the view of invading still farther western territory, the Kansas Pharmaceutical Association delegated Messrs. Robert J. Brown, of Leavenworth and George Leis, of Lawrence, to arrange an excursion which is to take place after adjournment. The route of this excursion will be through Kansas, Southern Colorado and Northern New Mexico to Santa Fe, and will occupy not over ten days; the fare for the round trip, including Pullman cars, will be \$30. Concerning the attractions of this excursion, we copy the following from a Western paper:

"No other locality on the Western Continent offers such inducements to an expedition of this kind as does New Mexico. In addition to the cool, bracing and invigorating air of these dry and elevated regions—which acts as nature's tonic and not only restores the invalid to health but wonderfully invigorates and rejuvenates the strong and healthy—there is here found a vast region which is almost a terra incognita to science. The vegetable productions of New Mexico are peculiar and strongly marked, the dryness of the climate giving greater aroma and pungency to plants than is found elsewhere, and producing a large number of strikingly original forms of vegetation. There are in these mountains and elevated valleys many plants and herbs supposed to possess wonderful medical virtues which are unknown to the medical fraternity, and we shall look for some valuable discoveries to be made by the botanists, chemists and other scientists of the expedition.

"New Mexico is at once the oldest and the newest region of America and is peculiarly the land of wonders. Here are found the latest and fullest remnants of the wonderful Aztec and Toltec civilization, the ruins of their ancient cities offering an inexhaustible field of research to the archaeologist and of speculation to the thoughtful student of history. Long ere the white man had planted settlements even at Plymouth Rock and Jamestown, the Spanish Jesuits had commenced building churches among the Indians of this region, some of the oldest buildings on the continent being still standing in excellent preservation. It was from New Mexico that Coronado started on his wonderful expedition, in the year 1543, in search of the seven fabled cities of Cibola, and the details of the historians of his great march show that even then the Spaniards had made a permanent lodgment and considerable progress in settling this region. Here, too, may now be seen the civilization of centuries ago, the forked stick plow and the most primitive methods of working and living.

"The mineral productions of New Mexico are well known to be varied and include many rare varieties and unique specimens."

LAWS ON THE ADULTERATION OF FOOD AND DRUGS.—For a number of years past the adulteration of drugs and medicines was the favorite theme of many essays and reports communicated to pharmaceutical and medical societies and published in their proceedings or in the journals. While it may be conceded that the statements made in those papers were all correct, it is evident that the actual condition of our drug market was not represented thereby. During the last thirty years or more a great deal has been accomplished in the United States in the way of diffusing pharmaceutical knowledge, and we believe it will be generally conceded that, with the spread of this knowledge, the quality of the drugs has steadily improved; that is to say, drugs are less in demand because they are *cheap*, but *quality* is now looked upon as the first consideration in the selection of drugs.

The drug law of June 26, 1848, has undoubtedly had the effect of excluding a large number of damaged and inferior drugs from the American market, and of preparations that were formerly manufactured in Europe for sale in this country. It is not our purpose to inquire whether the provisions of this law have been as effectually carried out as their importance seemed to warrant; it is, however, notorious that the "Special Examiners of Drugs" have not always been men whose judgment as to the condition and quality of drugs could be relied upon.

With the at least partial exclusion of inferior and adulterated drugs of foreign origin the business of the home adulterator was not reached; but it was in this connection that the essays and reports referred to above have accomplished much good, in exposing the nefarious practice and thus materially reducing or stopping altogether the sale of the adulterated articles. In most cases the adulterator is amenable to the law only for the damage done or for the amount paid for the goods; in exceptional cases, perhaps, criminal proceedings for obtaining money under false pretences might be maintained; but, on the whole, little has been done by legal enactments to stamp adulterations as frauds practised upon the public and to enforce a fine commensurate with the fraud.

That there are difficulties in the way of framing a law which would protect the public, and at the same time not throw unnecessary impediments in the way of legitimate pursuits, cannot be denied; whether the law proposed last year by the National Board of Trade will accomplish these objects remains to be seen. It has been passed and approved in the States of New York and New Jersey, and we may soon expect to hear more of it and the manner in which it will be enforced.

The law forbids the manufacture and sale of adulterated "food and drugs," the former to include every article used for food or drink by man, the latter to embrace all medicines for internal or external use. Articles are deemed to be adulterated

"a. In the case of drugs.

"1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein.

"2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or

other standard work on *materia medica*, it differs materially from the standard of strength, quality or purity laid down in such work.

"3. If its strength or purity fall below the professed standard under which it is sold.

"*b.* In the case of food or drink.

"1. If any substance or substances has or have been mixed with it so as to reduce or lower or injuriously affect its quality or strength.

"2. If any inferior or cheaper substance or substances have been substituted wholly or in part for the article.

"3. If any valuable constituent of the article has been wholly or in part abstracted.

"4. If it be an imitation of or be sold under the name of another article.

"5. If it consists wholly or in part of a deceased or decomposed, or putrid or rotten, animal or vegetable substance, whether manufactured or not, or in the case of milk, if it is the produce of a diseased animal.

"6. If it be colored, or coated, or polished, or powdered, whereby damage is concealed, or it is made to appear better than it really is, or of greater value.

"7. If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of a person consuming it: Provided, that the State Board of Health may, with the approval of the Governor, from time to time declare certain articles or preparations to be exempt from the provisions of this Act; and provided further, that the provisions of this Act shall not apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health and that the articles are distinctly labeled as a mixture, stating the components of the mixture."

The State Board of Health is entrusted with the execution of the law, and is charged with fixing the limits of variability permissible; with supervising the appointment as well as the discharge of public analysts and chemists, and with preparing rules and regulations for collecting and examining articles of food and drugs, the regulations and declarations of the Board to be printed in the statutes at large. All dealers are required to sell to the public analyst or other agent a sample of any article of food or drugs, sufficient for analysis. All violations or obstructions of the provisions of the act are regarded as misdemeanors and punished with a fine not exceeding \$50 for the first offence or \$100 for each subsequent offence. A sum not exceeding \$10,000 is appropriated for carrying out the provisions of the act.

It will be seen that the effectiveness of this law depends chiefly upon the manner in which it will be executed. It was perhaps a spirit of capriciousness, aggrandizement or mistaken importance through which, in Great Britain, many dealers have been, under the Adulteration Act, annoyed unnecessarily and unjustly. The law referred to above is calculated to do away with a good deal of this annoyance, since it is to be presumed that prosecutions will be instituted only upon the authority of the Board of Health, supported by the results of the investigations instituted by the analysts. Personal antagonisms are thus almost completely removed, and an interpretation of the law, uniform throughout the State, is insured as far as the executive officers are concerned.

We believe that the provisions of the law cover those "purely vegetable" and "innocent" nostrums containing mineral or vegetable poisons. Whether it can interfere with those quack medicines that make no pre-

tense in misleading the public by false statements of their composition, and that confine themselves to a laudation of their virtues in all sorts of disease, seems to us very doubtful. But a species of fraud which is frequently helped and assisted by physicians in all parts of the country, we believe, is not affected by this law; we refer to those preparations which consist of cheap ingredients and, frequently protected by trade-mark, are sold under fanciful names at exorbitant prices.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Medical Formulary based on the United States and British Pharmacopœias; together with numerous French, German and Unofficial Preparations. By Laurence Johnson, A.M., M.D., Lecturer on Medical Botany, Medical Department of the University of New York, etc. New York: William Wood & Co., 1881. 8vo, pp. 402.

The title indicates the scope of the work. The intention of the author was not to include all the drugs contained in the authorities mentioned; hence many of the less important have been omitted, and of those not recognized by any pharmacopœia only the more important ones have been admitted. The arrangement is alphabetical by the Latin titles as recognized in the United States and British Pharmacopœias. Under each head, in the case of animal and vegetable drugs, a brief explanation is given, indicating the part used, the source, natural order, habitat, together with brief descriptions of a few physical characters and of the medicinal properties. In the case of chemicals, either their source is indicated or formulas for their preparation are given, followed by brief descriptions, as before. Next are mentioned the various galenical preparations into which the drug enters, together with the official formulas, the language of which has been materially condensed without rendering it obscure. The titles of those official in the United States are in Latin, and printed in a different type; all other preparations have an English name only, including those which have been selected from the formularies of hospitals and dispensaries, as well as those which have been contributed by prominent authors. All formulas are given in the English language, and are followed by a statement of uses and dose, thus illustrating the manner in which the drugs are combined by prominent practitioners. In our opinion, it is to be regretted that the author has adopted the term "ounce" indiscriminately for the avoirdupois and troyounce, as well as for the fluidounce of the United States and Great Britain, thus designating four different values by one and the same term. Although this has been explained in the preface, we question the utility of this plan.

In examining the formulary we have observed few typographical errors and mistakes; the most important ones noticed are on page 156, where *Secale cornutum*, the old name for ergot, is given as the botanical name of rye, *Secale cereale*. In the formula for leptandrin, on page 245, the direction is omitted to mix the precipitated and powdered resin with the evaporated extract.

The work will be found to fulfill its aim of usefulness, both as to its contents and the readiness with which it may be consulted; and the publishers present it in a handy and very attractive style.

Proceedings of the Connecticut Pharmaceutical Association at the Fifth Annual Meeting, held in Waterbury Feb. 2, 1881. Hartford, Conn., 1881. Pp. 97.

An account of the meeting will be found on page 139 of our March number. The pamphlet before us contains the minutes and discussions, papers read, roll, constitution, and also the pharmacy act, approved April 14, 1881.

Seventeenth Annual Report of the Alumni Association, with the Exercises of the Sixtieth Commencement of the Philadelphia College of Pharmacy. Philadelphia, 1881. 8vo, pp. 116.

As usual, this publication contains the minutes of the Executive Board, of the social meetings and of the annual meeting, together with the various reports and addresses before the association; also the introductory lecture and valedictory address to the last course held in this college. The pamphlet may be obtained by addressing the secretary, William E. Krewson, Ph.G.

Tenth Annual Report of the Alumni Association of the College of Pharmacy of the City of New York. 1881. 8vo, pp. 62.

The pamphlet contains the minutes of the meetings, the address of the President, the commencement exercises with addresses, constitution, roll, etc.

Die Verhältnisse der Pharmacie in der Schweiz. Mai, 1881. Schaffhausen: Brodtmann'sche Buchhandlung. 8vo.

The Condition of Pharmacy in Switzerland.

In 1879 the Swiss Apothecaries' Society appointed a committee of seven to investigate the condition of pharmacy in all cantons of Switzerland, and to make propositions for the uniform regulation of the practice of pharmacy throughout the country. The pamphlet before us contains the report of that committee. The laws and regulations bearing on pharmacy, which are now in force in the 24 cantons, are conveniently exhibited in six tables appended to the pamphlet.

Untersuchung des Bieres auf fremde Bitterstoffe.

Testing of Beer for Foreign Bitter Principles.

This is a modification of the process formerly adopted by Prof. Dragendorff for the detection of adulterations in beer, and is a synopsis of the process described in a work, soon to be published, on the detection of adulterations in food.

A Preliminary Catalogue of the Flora of New Jersey. Compiled by N. L. Britton, Ph.D., with the assistance of eminent botanists. Office of the Survey, Rutgers College, New Brunswick, N. J., 1881. 8vo, pp. 233.

This Catalogue forms part of the publications of the Geological Survey of New Jersey, and by the State Geologist, Mr. Geo. H. Cook, has been communicated to a number of botanists, with the object of making full notes of localities, common names, and whatever else may be of interest regarding the botanical products of the State. The work is well gotten up for the purpose; a large number of localities are mentioned; the plants occasionally found on ballast ground in the vicinity of New York and Philadelphia are enumerated, and lists of the lower cryptogams, lichens, fungi, algæ, etc., have been carefully prepared.

Anatomical Studies upon Brains of Criminals. A Contribution to Anthropology, Medicine, Jurisprudence and Psychology. By Moriz Benedict, Professor at Vienna. Translated from the German by E. P. Fowler, M.D. New York: Wm. Wood & Co., 1881. 8vo, pp. 185.

This is an inquiry into the conditions of the brains of more or less noted criminals, and their variations from the normal type of cerebral structure. An introductory chapter explains the structure of the brain, and renders the work interesting and instructive to those not conversant with anatomy. It is embellished with a number of illustrations reproduced from photographs by the photo-engraving process.

Statistics relating to the Saline Interests of Michigan. Compiled by S. S. Garrigues, Ph.D., State Salt Inspector, and reported by the Committee on Lumber and Salt. Lansing, 1881. 8vo, pp. 48.

The Saginaw valley is at present the largest salt producing district in the United States. The manufacture commenced in 1860, when 4,000 barrels of salt were produced. In 1869, when the inspection law took effect, the production was 560,818 barrels; during the year 1880 it reached 2,676,588 barrels, or 13,382,940 bushels. In the latter year the production of the Onondaga district was 8,481,473 bushels.

The following reprints have been received:

Dinitroparadibrombenzols and their Derivatives. By W. D. Schoonmaker and J. A. Van Mater. From "American Chemical Journal," June, 1881.

Tubercular Laryngitis, or Laryngeal Phthisis. By Prof. C. J. Lundy, M.D. From the "Physician and Surgeon," Ann Arbor, February, 1881.

Hip Injuries: Including Hip-joint Disease and Fractures of the Femoral Neck; Splint for. By De F. Willard, M.D. From "Phila. Medical Times," November, 1880.

Hip-joint Disease: Death in Early Stage from Tubercular Meningitis. By De F. Willard, M.D.—Microscopical Appearances. By E. O. Shakespeare, M.D. From "Boston Med. and Surg. Jour."

Ether Death; a Personal Experience in Four Cases of Death from Anæsthetics. By J. B. Roberts, A.M., M.D. From "Phila. Med. Times," June 4, 1881.